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**On the Cover:** The Symbology of the Sea (see p. 3, p. 36)

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## IN THE NEWS

EDUCATION • Total enrollment in all U.S. schools and colleges at all levels last Fall was 46 million, one person in four. In 1950 the total was 30 million, one person in five. • Among the findings of a recently released UN survey of *Study Abroad* (Columbia U. Press, $3.00): the U.S. and Russia have low proportions of foreign students enrolled in their countries, the U.S. 1.5% of the 3,236,000 students in its higher education system, Russia 0.5% of its 2,179,000; in Tunisia foreign enrollment is 33.6%, in Britain, 10.7%; throughout the world there are 200,000 foreign students, 1.9% of a total university enrollment of 10.5 million; Greece has the most nationals studying abroad (8,143) followed by the U.S. (7,609); the largest number of foreign students study in the U.S., followed in order by France, West Germany, Britain, Russia, Argentina, Austria, Switzerland, Canada, and the U.A.R.; scholarships and fellowships for foreign studies are available from 1,761 organizations. • The *African Scholarship Program of American Universities* will bring as many as 200 African students on four-year scholarships to some 80 U.S. colleges in Fall, 1961. • NYU will build a research and residential community on a 1,000 acre woodland tract 35 miles NW of New York over the next 10-20 years. • Growing concern with high school social science is footnoted by new Scott Paper Co. program of Fellowship Awards for social science teachers in public high schools.

PROGRAMS AND STUDIES • U. of Michigan's *Center for Research on Conflict Resolution* since its founding in June 1959 has received some $170M in support, presently has 16 projects planned or underway, for example R. C. Angell and J. D. Singer's "Comparison of Soviet and American Values and Foreign Policies," R. A. Hefner's project for "the measurement of international attitudes and opinion, with the eventual goal of developing measuring instruments which can provide comparable information from different countries regarding the state of the world." Most recent project: study of problems of coordinating State-local expenditures with federal expenditures in case of major cutbacks in defense spendings, with a $9M grant from the C. Reynolds F. • The *Research Center for Group Dynamics*, also at U. of Mich., has a handful of new research projects: Director A. Zander has $87M from the U.S. Office of Ed. for a three-yr. study of group aspirations; Program Director R. Lippitt will make an analysis of the classroom learning environment with a grant of nearly $60M from the same source; R. Zajonc has $28M from the U.S. Air Force for research on selective factors in cognition and perception. • The flourishing of social science research at U. of Mich. is further dem-

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**THE AMERICAN BEHAVIORAL SCIENTIST** is published monthly except July and August at Princeton, N.J. It is written by and for social scientists and associated laymen, and carries accounts of inter-disciplinary research, articles on creativity and social invention, comment on the relations between behavioral scientists and society and government, and broad, annotated listings of new studies. It stresses general theory and operationalism, and aims at establishing the role of behavioral science in the modern world. Contributions and comments are invited.



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# Ahoy, Marine Sociology

*by* CLARK CAMERON

*There are new aquatic vistas for sociology in the unsurveyed lives of mariners, fishermen, and skindivers. Why do some societies send their people down to the sea while others do not? Why are some cultures content to fish, while others range afar for commerce and conquest? If marine agriculture is to counter the population explosion, what social skills and forces will bring it about? Clark Cameron, a long-time sailor and student of the Far East, is with Opinion Research Corporation of Princeton. He has organized a new Institute for International Marine Research which, hopefully, will lead to some of the consequences outlined in this futuristic article.*

In June 1961 the auxiliary sloop *Salee* began beating her way up the New England coast on a peculiar nautical mission. Her crew was to conduct tape-recorded interviews with scuba divers, underwater hunters and photographers, and with seafarers. Simultaneously there began in Princeton a systematic bibliographical study of the literature on man's involvement with the sea. The focus of the study was dual: (1) social relations and social structures in the marine environment, and (2) man's relations with marine life. Scholars and experts in such diverse specialties as archaeology, comparative politics, ichthyology, industrial fishing, marine ecology, naval history, navigation, psychiatry, Russian literature, seamanship, social psychology, social theory, and television were asked to contribute, comment, and undertake complementary studies.

The objectives of this activity were modest. First, a basis was needed for encouraging social science study of a relatively untouched area. Man's involvement with the sea had been mounting at an increasing rate and with increasing significance for human destiny, yet few of the available resources of social research had been directed at the many emergent problems. Second, the *Salee's* New England voyage launched a sociological study of 2,000 divers and 500 seafarers throughout the world. While interviewing experienced divers and seafarers in the world's major maritime areas, *Salee's* crew was to gather extensive information from respondents that would help determine the social and cultural conditions under which men and women tend to assume these roles and to perform them competently. Equally important, testimony was to be gathered on respondents' personal experiences with the sea and with various forms of marine life.

The expedition was almost calculatedly primitive in its approach. It was not designed to produce some startling gain in human knowledge of a heretofore unknown world. Rather, through patient and continuing experience and reflection upon data painstakingly gathered, it was believed that outlines and structures would begin to take form and parameters of the new field emerge.

The subsequent scholarly and lay interest in the development of marine sociology led to the first international conference on "Man and the Sea," held in Princeton in the Summer of 1965. The remainder of this report outlines some highlights of our beginning efforts to develop a science of man in his marine environment.

## THE SOCIOLOGY OF MARINE AGRICULTURE

By 1960, students of population pressures on food supply had begun to agree on three things. First, man's exploitation of oceanic food resources had hardly begun. Second, the need to develop and cultivate these resources was becoming urgent. Third, as man moved *en masse* into this new environment, he could defeat his own ends if he were characteristically careless of the complex and interdependent patterning of species and organic life. Assulted brutally and shortsightedly, the supposedly inexhaustible oceans

might well be rendered unproductive and eventually desolate.[1]

By 1965, another major problem had become evident. If marine agriculture was to become a flourishing industry based on a productive relationship between man and the marine world, the introduction of appropriate technology would not be enough. An anthropologist from the University of Bombay provided one of the more memorable statements of the problem:

"India has a food problem, yes. It may appear insoluble. But we also have a generous coastline and teeming waters, and we have people who fish, mostly according to traditional methods it is true. But relative to the food we need, how many fishermen? Relative to the proportion of Indians engaged in agriculture, how many farm our seas?

"We Indians are struggling simultaneously for economic growth and for political freedom. We must somehow create the voluntary social conditions within which marine farming can flourish. Sizeable numbers of Indians must somehow be encouraged to develop and to use the necessary marine skills, both surface and subsurface, that are needed. How do we go about this? What has to be changed, and how, so we may recruit and train such a body of men and women? India is not, after all, known for its mariners, while the British love for the sea accounts for my being here today to address you in English on a scientific question affecting India's survival as a free society. I am not asking for a 'theory of oceanic imperialism.' I merely want to know, because we Indians will need to know, what is this compulsion to find a human destiny on and beneath the waters of the world? What explains such behavior and values and strivings? Are they reproducible?

"Surely, gentlemen, this would be a cruel irony: that only those who need marine agriculture least—the French, the English, the Americans, the Russians—should prove capable of developing and applying it, while those of us to whom it presents one of the few avenues of escape from malnutrition—we Indians with our surrounding oceans, the Egyptians with their abundant Red Sea, other peoples like those of Somalia who scarcely touch their fecund waters—should be unable to conceive of a full productive relationship with the marine environment, and should go hungry or begging in the midst of plenty.

"Perhaps, as social scientists, we must admit that cultivation of the seas can only flow from cultivation of the kinds of men and women who make the seas their own. But what do we then have to say about how to cultivate such people while there is time?"

These remarks indicate the conference's concern with the social aspects of marine agriculture. The chairman of the panel summed up the problem: "If there is to be marine farming, there must be marine farmers. How do we get them where and when they are most needed?"

### The Comparative Study Of Maritime Communities

The Panel on Marine Agriculture suggested that several research tasks in comparative analysis of maritime communities might shed light on the problem of "cultivating the cultivators." One recommended study was analysis of ethnological data (beginning with the Human Relations Area Files) to determine the critical variables accounting for differences and anomalies in cultural attitudes toward fishing and fish consumption. (Related to this, the Committee on Marine Concepts was charged with gathering and classifying the concepts involved in acquiring and utilizing all forms of marine life as food in various languages, cultures, and subcultures.) Numerous maritime societies and cultures have had what appear to be the same economic need and physical opportunity to use marine food resources. Some have developed the attitudes, skills, and social structure to permit at least partial exploitation of these resources; others have not. Analysis of such contrasts, it was felt, might provide a more solid founda-

[1]Well before underwater hunting became a mass phenomenon, authorities on marine ecology were voicing their grave concern lest man's assault on marine life prove devastating. For an early example, the article on "Fisheries" in the 1946 edition of the *Encyclopedia Britannica* contains a disturbing discussion of the problems. A later example appears in the introduction to Carleton Ray and Elgin Ciampi's *The Underwater Guide to Marine Life* (New York: Barnes and Co., 1956).

tion for creating the requisite skills and conditions among various populations.

Attention was directed to important cultural variations not only in the technology of fishing, and the degree of exploitation of marine resources, but also in the social functions of these activities. Comparative study of fishing and fish consumption from the perspective of cultural dynamics might lead to understanding the kinds of obstacles that exist, even in modernizing maritime cultures, to a rational exploitation of oceanic food resources.

Central to this kind of research would be a study of social change as it relates to fishing and fish consumption. Several historians were invited to begin scrutiny of available data to determine the social factors at work in the waxing and waning of fishing and fish consumption in various eras and civilizations. Studies of fishing communities and of fishermen, it was noted, had pointed to a sort of "fishing weltanschauung"; the fisherman has often seemed embedded less in an economic or occupational pursuit than in a way of life. In the traditional fishing community, requisite skills and attitudes are transmitted almost as esoteric lore from generation to generation, and observers have often remarked the tenacity with which fishing communities resist forces that might change their pattern of life. (They hold this tenacity in common with sailors; both groups tend to ignore or resist either marked deprivation or reward as incentives for occupational change.) This raised questions relating to the necessary and sufficient conditions for introducing modern technology into the world's fishing industries on the required scale. Could enough change-minded individuals emerge among traditional fishing and diving groups to carry out the transformation? Or would a virtually new class of marine workers be required? If so, how would they be recruited and from what population groups?

### Seafaring Peoples

Closely related to these research areas were those mapped out by the Panel on Seafaring, which noted that much remained to be learned about the relations between seafaring and fishing. Historically, some societies seem to have produced seafarers bent on commerce, exploration, warfare, or slavery, but little given to fishing; yet later, fishing became their dominant marine activity. Other cultures seem to have engaged extensively in fishing their inland or coastal waters without venturing further to sea. By what complex of social forces are herring fishermen changed into marauding Vikings and then back again? What can be learned from Japanese history, in which a vigorously seafaring population was bridled into virtual maritime inactivity under the Tokugawa Shogunate and then, under the Meiji Restoration, transformed again into the most vital of Asian fishing and naval powers?

The panel's interest in seafaring opened onto many research vistas. Scholars specializing in naval affairs and in political sociology, for example, were invited to inquire into the concept of naval power. How and when does it take form? Suggested studies included (1) an historical inquiry into the impact of Chinese and Japanese concepts of naval power on their contrasting response to the intrusion of the West; (2) an international opinion survey of "power elites" to reveal the distribution and nature of their marine concepts in military affairs; and (3) an anthropological study of ethnographic data designed to classify primitive cultures along a continuum of their experience in marine warfare, in a search for hypotheses that might explain the emergence of the concept.

Migration by sea has been one of the great shaping forces of the world, the conference agreed, yet here too the social sciences have their work ahead of them. Comparative analysis has scarcely begun. For example, the Chinese, although one of the least seafaring of peoples, nevertheless produced large-scale sea-borne migrations to the islands of Southeast Asia, while the seafaring Japanese did not. The French, despite their renowned seafarers and the proud role of naval power in French history, undertook comparatively little migration by sea compared with the English or Spanish. What was once a relatively massive migration of Polynesian peoples, spanning almost the entire Pacific and occupying four milennia, came to the end of its reach before attaining continental America.[2] Many critical aspects of man's relations with

his marine environment would be cast into relief in a proposed study of *Marine Migrations: Causes, Conditions, and Consequences.*

Several space-oriented scholars discussed the possible significance of such a study for man's colonization of the planets. Others were interested in possible implications for underwater colonization. Critical in this orientation was the need to synthesize a rather vast but scattered body of work, focused a bit too heavily on certain historical epochs of marine migration to and from specific cultural areas such as Europe and the United States.

### The Symbology Of The Sea

Few cultures appear to have been without their own versions of sea gods, goddesses, and sacred animals. Whether in mythology, religion, art, folk music, or daily vocabulary the sea in all its mystery, fecundity, vastness, and awesome power has been a prolific generator of symbols, images, and ideational structures. The sea offers data in profusion for the sociologist interested in occupational function and status symbols; for the political scientist studying symbolic cues to the authoritative allocation of roles and values; for students of myth, legend, ceremony, ritual, and superstition; for the psychoanalytically-oriented student of personality and interpersonal dynamics.

One member of the Panel on Symbology of the Sea remarked on the behavioral codes of the marine environment. "The most amateur boatsman who ventures out to sea from New Haven or Antibes is given to understand that he must observe the International Rules of the Road; and, for the sociologist, an intriguing set of guides to behavior they are. On the one hand there are such rational and enforceable codes and rules for conduct under specified conditions for specified actors, determined by specified authorities (maritime law); on the other there are apparently irrational and unenforceable codes kept operative primarily by informal social sanctions, taboos on certain topics of wardroom discussion for example."

Other panel members emphasized the importance of "symbolic setting" and the diffusion of marine symbols as clues to historical processes and to specific historical events. What, for example, was the origin of the disastrous Aztec myth that anticipated the arrival of Cortes and helped put an entire civilization at the feet of a handful of Western adventurers? A parallel is the persistent legend among the Incas and other Indian societies in the Americas about ship-borne gods who have sailed away and will return. If comparable myths were correlated in terms of their geographic distribution, we might be tempted to revise our estimates of the extent of Phonecian, Polynesian, or Viking excursions.

The role of marine symbols in matters of contemporary concern occasioned questions such as these: Would it be possible to monitor Chinese Communist literature so as to gauge in advance the likelihood of China's turning actively to the sea in its search for national power? Is it of any particular significance that Communism has not yet come to power in a seafaring society? Is the inherent mobility of seafaring populations inimical to extreme social control? Or does the correlation between marine mobility and political freedom become significant only when certain cultural symbols expressing this relationship gain some critical level of dissemination and explicitness? It is historically obvious that the sea may be conceived equally as an ultimate barrier or as an ultimate avenue to personal and social mobility.

### The Comparative Study Of Popular Marine Activities

To survey researchers and other statistically-minded social scientists at the conference, a particularly promising area was the extent to which various populations have acquired and elaborated surface and subsurface marine skills and interests. Reasonable inferences about the consequences of such interests could be drawn and subjected to empirical verification. For example, warfare be-

[2]Robert C. Suggs, in *The Island Civilization of Polynesia* (New York: New American Library, 1960), provides a concise examination of available evidence from many disciplines. A contrary point of view is summarized by Joseph Campbell in *The Masks of God: Primitive Mythology* (New York: Viking Press, 1959), especially in "Parallelism or Diffusion," p. 202 ff.

tween societies of all levels may be the ultimate in "reality-testing" for action systems organized around images of the world and man. The peculiar obtuseness of the Nazi high command to the strategic demands of global warfare, and even to the strategic significance of the Mediterranean, could hardly have occurred among a people accustomed to a many-dimensioned involvement with the sea.

The Panel on Popular Marine Activities anticipated that reliable global data on the question, "How many people of what groups can and do swim in the sea, with what frequency and under what conditions?" might provide analytic assistance in many research areas, ranging from marketing studies to analyses of social structure. Other statistical questions with intriguing possibilities for social analysis concerned significant differences among various population groupings in "going to the shore," pleasure fishing, skin-diving, boating, residence on boats, membership in formal and informal groups centered around marine interests, and the structure of popular attitudes toward such activities—*i.e.,* incidence of various "negative images" vs. "neutral" and "positive images." To this end, plans were begun for a specific research proposal for a national probability survey.

Additional inspiration for the proposed study was provided by the military affairs analyst of the *New York Times,* who presented the conference with a new concept in marine warfare that might give a revolutionary advantage to a nation possessing a high level of popular marine skills and involvement. He suggested that atomic submarines, either acting as massive troop carriers or towing them, could debouch hundreds of thousands of fully mobile, atomically-armed underwater troops all along an enemy coastline in a massive commando operation. The ability of a power to exploit these and similar possibilities would depend significantly on the level of its popular marine skills. Among the research questions raised were: Which of the various powers would be most likely to adopt such an approach to warfare? What counter-strategists might prove most effective? What forms of underwater military organization, transport, and communications would best fit this pattern of warfare?

## Implications For "Grand Theory"

The Panel on Social Theory and the Marine World confined its discussion largely to one question. What would happen to notions about "social systems" and "political systems" when the research focus shifted to areas in which boundaries are most likely to be poorly maintained or porous, and where the determinants of action within the terrestial system may often prove to be located within the marine system of interaction? Whether the new framework would provide opportunities for important theoretical growth or not, the panel felt there would be significant new data for testing theory at virtually all levels of generality. Studies of such marine action groups as divers and seafarers; of such organizing images of the world as are reflected in the symbology of the sea; of such confrontation of systemic images in reality-testing through marine conflict and accommodation; of social and political structures in their relation to marine concepts and mobility; of elite and popular marine skills and interests—all within an emergent discipline of comparative analysis and within a coherent framework of theory and empirical procedures—would contribute not only to the emergent great needs of man in his marine environment but also to the general science of man toward which we strive.

## Postscript: Spring 1961

The *Salee* has not yet embarked on its world-wide study of divers, seafarers, and their reports on man's deepening involvement with marine life. The task of compiling the fundamental bibliography on Man and the Sea has not yet begun. Experts in widely scattered fields of human knowledge have not yet been enlisted as contributors to a common task. The First International Conference on Man and the Sea has not been held. A journal serving as a forum for the varied interests of those concerned with man and the sea has not yet appeared. But the need for these endeavors, and others like them, begins to be sharp and clear.

# Research Philosophy

*by* CENTER FOR INTERNATIONAL STUDIES, M.I.T.

*The rich, we know, pass into heaven only with great difficulty. M.I.T. and its component parts are well-endowed, receive solicitous attention from the richest foundations, and capitalize on the magic of the hardware sciences. Moreover, academic research organizations that claim a rationale beyond mere housekeeping must be viewed suspiciously; their rationalization comes glibly. Withal, the Center for International Studies of M.I.T. has risen above these conditions over the years. The pragmatic theory of making meaning out of process and shaping process from meaning is manifest in this statement of the Center's philosophy, from its Eighth Annual Report.*

Fundamental contributions to human knowledge are seldom collective products. They require imagination, the power of synthesis, insights that transcend common sense, and a capacity to reconstruct the data of experience in new and more meaningful ways. These are attributes of individuals, not of organizations. An institution that attempts to impose too logical a pattern on the activities of its members is in danger of stifling the spontaneity which lies at the heart of creative advance. Thus the most creative research organizations regard themselves as collections of individual scholars bound by no mechanical classification of common problems, each free to pursue his independent interests by whatever techniques seem to him fruitful. The current research program of any institution dominated, as is the Center, by this philosophy is bound to consist of a collection of projects the rationale of which may appear lose and in some respects even self-contradictory. While it is comparatively easy in a prospectus to draw up orderly and impressive research plans, these may be misleading; the work actually carried out will and should depend in considerable measure on accidents of opportunity, on the changing demands of users, and on the evolving interests of the research workers themselves.

Yet there would be little excuse for an organization like the Center if its sole function were the routine administration of a series of independent and unrelated projects. The success of such an institution is to be measured by the degree to which there emerges from the work of its individual members something that is greater than the sum of the component pieces of its program—a characteristic approach, a distinctive set of related hypotheses, a number of shared convictions as to what it is important to work on and how the work can best be advanced. From the first several years of research there has begun to emerge a distinctive point of view which can be said to be characteristic of the Center's program as a whole and not merely of individual projects.

### POLICY ORIENTATION

First, our work has been and will continue to be more policy oriented than that of many other organizations with similar titles. Our major programs have been selected partly because of their high relevance to some of the great problems which will confront the world community over the next decade: relations between the two major powers, the United States and the Soviet Union; the efforts of two-thirds of the world's people to create for themselves progressive increases in their material welfare and standards of living; the rapidly increasing interdependence of the cultures, economies, and power structures of previously relatively autonomous groups which has resulted from the technological revolution in the communications of ideas, goods, and people.

On the other hand, it must be emphasized that our comparative advantage as part of an academic institution lies in fundamental research. We fail in our task if we do not penetrate beneath current policy issues as perceived by those responsible for action to the

underlying social forces continuously altering the framework of international action. We shall most effectively bridge the gap between fundamental knowledge and policy analysis if we work concurrently on projects at all points on the spectrum from such fundamental inquiries of limited applicability as the characteristics of the xenophilic personality, the variability of factor proportions in production functions, and the psychological motivations of the innovator to such practically urgent questions as what should be U.S. policy with respect to foreign economic aid, how can Americans going to India be better prepared for their experience there, how can the Indian Five Year Plan be modified to increase its chance of success?

### The Process of Change

A second feature of what is coming to be the characteristic Center approach is our concern with the process of change. There is in much social science research on foreign areas a static bias. The questions asked tend to take the form, "What is society X like? What is the character of its institutions? What are the attitudes of various elements of its population? What is the structure of its economy?" rather than the form, "In what directions is the society evolving? How rapidly and in what directions are institutions, attitudes, and structure changing and where is this process of change likely to lead?" This bias is partly a consequence of the stage of development of the social sciences. Dynamics is always more complicated than statics; rates of change are harder to measure and analyze than states of affairs. Beyond this, there is logic in the desire to know where we are before we ask where we are going. Also, the empirical study of social change requires a series of observations made according to a consistent plan over a period of years many times the duration of a typical project.

But we must not let our view of reality be colored by the limitations of our analytic tools or our observational capabilities. No research is required to document the proposition that the most important characteristic of our times is that societies are changing in almost all their fundamental dimensions at a rate wholly unprecedented in history. All our most crucial international problems require appraisal of patterns of evolution, not of states of affairs. Economic development, newly emergent nationalism, trends in the character of Communist society, the political implications of changing weapons technology —these are all questions which cannot even be posed except in dynamic terms. If we are to deal with them at all, we must find ways of introducing process explicitly into both our analytic frameworks and our empirical observations.

There are a number of ways of doing this. The most satisfactory, in one sense, would be to have a permanent staff analyzing and observing the same set of issues over a considerable number of years; this should be done, although unfortunately we cannot often wait this long for answers. In economics and to a lesser extent in some of the other social science disciplines we can construct abstract theoretical models of reality which include time as an explicit variable and which may at a minimum illuminate some of the alternative possible paths of evolution. We can also attempt to get a running jump into the future by calling upon the historian to carry some of our currently perceived problems back into the past; unfortunately, the available historical materials are frequently hopelessly inadequate for our purposes. Finally, to the extent that we can assume that there are patterns of evolution common to a number of societies which find themselves at different historical stages, we can try to learn something about evolutionary change by examining contemporary situations which are representative of these various stages. We have tried at the Center to use all these methods. An awareness of the problem of rates of change permeates all our investigations.

### The Internal Dynamics of States

Third, the Center's research program has been and will continue to be strongly influenced by our conviction that the international behavior of states is conditioned in very important ways by their internal dynamics. To understand how a country like India, for instance, will behave internationally over the next couple of decades, we believe it is

fully as important to appraise India's economic development prospects, her domestic political evolution, the likely changes in her social structure, and the entire set of goals and motivations of her leadership as to study her current and past foreign policy in detail.

Beyond this, national states themselves, especially the more recently created ones, are not of course homogeneous entities possessing a common will but are themselves collections of interacting communities and groups. Even in relatively integrated countries with a long national history, like the United States, foreign policy is the resultant of a very complex interaction of subgroups with varied outlooks and purposes. There is a real question as to whether some of the newest nations have enough sense of national identity to give the concept of national interest any significant meaning whatsoever. The implication of this for a research program concerned to get at the deeper roots of international behavior is that the vast bulk of the work carried on in such a program may concern itself with problems that appear superficially to have little relation to international affairs. Thus the Center's interest in international behavior has led us to study such problems as the character of Soviet scientific and technical education, the pattern of influence and communication in a Turkish village, the pattern of inputs and outputs on a small number of Indian farms, and the nature of local leadership in four Indonesian towns.

The recognition that the behavior of larger social units such as nations depends in turn on the behavior and interactions of smaller units such as provinces, business communities, castes, and even families and individuals poses a serious dilemma. The two or three villages or business firms or newspapers or professions that one can afford to look at in detail may tell one very little about how the multitude of micro-forces in a national society aggregate to produce a national or an international result. One can best live with this dilemma, we feel, by carrying forward simultaneously projects at various levels of aggregation, from a few attempts to probe deeply into local situations through less penetrating studies of larger groups and problems up to a necessarily somewhat superficial attempt to encompass the dynamics of a whole nation or a group of nations.

### Multidisciplinary Research

The fourth distinguishing characteristic of the Center's research philosophy is the endeavor to apply to each of its problems insights derived from a number of the social sciences. The various social sciences have developed different capabilities for handling different levels of social aggregation. By and large, anthropology and psychology are most confident and most at home in applying a microscope to individuals or small groups. Political science, on the other hand, has traditionally taken as its province the study of national and international institutions and organizations. Economics is the social science discipline which has made the greatest progress toward integrating the analysis of the behavior of individuals and small economic units with the study of national and international aggregates.

Because of these and other considerations, a determination to be interdisciplinary characterizes most social science research organizations today. Ways of doing it, however, vary from institution to institution. The Center's approach has been to encourage each member of its staff to devote a substantial portion of his time to intellectual problems lying largely within his professional discipline but to concern himself as well with practical and applied issues the solution of which requires, as a matter of common sense, attention to a variety of factors outside his normal disciplinary competence. People with different disciplinary backgrounds are brought together not so much for the purpose of explicitly integrating their disciplines as for the purpose of consulting on applied issues which they approach from different points of view. We have found that this produces over time a community of people each of whom continues to be confident and capable in his own specialty but who has at the same time a keen awareness both of the limits of his own discipline and of the capabilities and limitations of the tools used by others. . . .

# Ascertaining National Goals: Project Aimscales

*by* Stuart C. Dodd

*The Director of the Washington Public Opinion Laboratory, at the University of Washington, describes a project to develop a scientific instrument designed to ascertain the nation's hierarchy of goals, relying on polling in depth. The proposed project is based on a number of supporting and explanatory studies and is currently seeking financial support.*

There is a growing realization in the United States that our national purpose needs strengthening. We need clearer statements of our goals and purposes—one evidence of which was President Eisenhower's appointment of a Commission on National Goals last year (1960). We need deeper concern about the directions and pace of the nation's development in the rest of this century, in the face of the clear and strong purposes of our rivals in the cold war. We need top-level agencies for national planning within the democratic framework—as is apparent in the hearings and program of the Senate Subcommitee on National Policy Machinery. In short, we need clear agreement on our national goals; they should be made known to more citizens, be more strongly felt and effectively pursued.

This pursuit of goals includes all that is compatible with what our citizens, officials, and experts aspire to, enjoy experiencing, and search for. It includes all that people think wisest, want most, and work hardest for, both personally and publicly, in groups and in organizations. It should include all that was encompassed in what our founding fathers called "the pursuit of happiness."

The first step in a democratic pursuit of goals is to ascertain exactly: What is America's current *inventory* of goals? For a scientific answer we need to measure all aspects or dimensions of our hierarchy of goals. And to do this we need better instruments for observing the facts. One such instrument is "aimscale," whose construction is the purpose of the present pilot "Project Aimscale." The project, building on extensive research on values in the behavioral and semiotic sciences at the Washington Public Opinion Laboratory and elsewhere, is designed to begin systematic construction, calibration, and comparison of alternative aimscales, toward standardizing a best possible aimscale for the United States.

The immediate consequences of better aimscales would be better periodic measurement of the nation's goals and subgoals (*i.e.*, whatever the ends and the chief means thereto in a given period), and the degree to which they are achieved. The better we measure these three factors of the national transaction called "pursuing goals"—the goals, means, and results—, the better will the behavioral scientist be able to predict and control them. The more remote consequences will be increasing use of scientific methods in learning "what works" *to accelerate full and balanced progress.*

### The Structure of the Aimscales

Aimscales are to be built from ratings about desiderata—any objects of value—by representative samples of American citizens, in a standardized poll-in-depth situation. The initial model of the aimscale will encompass the ten major goals of the nation for the decade of the 1960's. Each goal will be rated on three indices: for its amount, or size; its relative desirability, or worth; and its feasibility, or probability.

The statistical structure of such an aimscale is a matrix of 30 indices from polls, namely, the ten major goals each with a subindex estimating its target size, its worth, and its likelihood of achievement. With appropriate summarizing indices we might be able to make such statements as: The national goals for next year are a 3 per cent increase in all target indices at a 1 per cent increased cost in tax level, both estimates

having a 90 per cent estimated probability of achievement.

We seek ratings which are highly *universal* in structure, both substantively and methodologically, and which also fulfill to a high degree the three functional criteria outlined in the following section. We seek highly universal *forms* of ratings for any objects of value, as a sort of "metamoney" in terms of which the size and worth of any desiderata—any goals or means that people want—can be expressed and compared and systematized. We seek ratings that are highly universal, whether in content referred to or in method of measuring respondents' perception of it.

Two particular examples of aimscales illustrate these requirements. They are selected from the many alternative versions collected or devised for testing in Project Aimscales. The first is an example of an index for a single goal, called a "trisept" rating. The respondent is asked, "Should our total expenditure for aid to foreign countries [or whatever the desideratum at issue] be more, or less, or stay as it is now?" If the answer is "more" or "less," the respondent is shown one or the other of two cards on which there are seven-point rating scales:

Very little more 1 2 3 4 5 6 7 Very much more

or

Very little less 1 2 3 4 5 6 7 Very much less

Such a "trisept" rating first obtains an answer among three highly universal alternatives and then refines any change into seven degrees. Our research in the literature and some of our pretests indicate that, even though people may be ill-informed and uncertain, they can answer in this subjective form, first in terms of a status-quo-vs.-change choice and then in terms of their perceived range, more easily and in more situations than in alternative, sometimes more objective, versions of aimscales.

The trisept rating has four facets that are fixed largely by the scientist-observer:

(1) The *limiting points* or range of the rating are fixed relative to the perceived status quo first, and then relative to the respondent's perceived extremes.

(2) The *units* are 14 equal-appearing intervals.

(3) The *index* is whatever the words "our total expenditure for aid to foreign countries" means to each respondent.

(4) The *level* of observation is at the first or quantitative power level, on a 15-point rating scale.

The second version of an aimscale not only obtains information about whether the respondent wants more, less, or the same amount of a specific goal, but also obtains information about the *amount* of the specific goal that the respondent believes us to have at the time of the interview. For example, he is given eight basic aims of "our" schools, elementary and secondary, and is asked to rate them twice. First, he is asked to rate how much emphasis he thinks our schools *do* place on each of the aims listed; second, he is asked to rate how much emphasis he thinks our schools *should* place on each of them.

Rate how much emphasis you think our schools *do* place on each of the following aims:

| | Very little | | | | | | A lot |
|---|---|---|---|---|---|---|---|
| 1. Teach basic subjects | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 2. Teach vocational subjects | 1 | 2 | 3 | 4 | 5 | 6 | 7 |

Rate how much emphasis you think our schools *should* place on each of the following aims:

| | Very little | | | | | | A lot |
|---|---|---|---|---|---|---|---|
| 1. Teach basic subjects | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 2. Teach vocational subjects | 1 | 2 | 3 | 4 | 5 | 6 | 7 |

The complete set of eight aims listed in the questionnaire are, in addition to the two listed, (3) Instill a sense of civic responsibility, (4) Prepare students for further education, (5) Develop abilities of the exceptionally gifted child, (6) Provide remedial help programs for slow learners, (7) Give personal guidance counselling on emotional and social problems, and (8) Give students guidance on school careers and selection of jobs.

For each aim, the rating of how much *should* be done is compared with the respondent's opinion of how much is *actually* being done. The direction of difference indicates whether more or less emphasis on specific aims is desired. The extent of difference indicates the strength of feeling. (In free response or depth interviewing, by comparison, respondents tend to talk much

more forcefully about the aims for which the "gap" is large than about the aims which fall in line with what they think should be done.) In community polling, these two sets of rating questions are asked not only of the citizens but also of the teachers. Then a comparison is made to ascertain how the ratings of the "experts" differ from those of the citizens. Various patterns of response call for different kinds of action. For example, if both the experts and citizens agree that a specific aim should be emphasized much more than at present, a further study of the curriculum and school activities may be made and may result in some change in the curriculum. In another case, a follow-up on areas of disagreement may point up that the only need is for a better flow of information to the citizens about what is actually being done in the schools.

For each item or index of goal pursuit in the aimscales we propose to build alternative facets to be tested, in order to find those most universal in structure and satisfactory in terms of function. For example, these are some alternative facets:

(1) For alternative *limits*, we may test "none vs. all" or "least vs. most."

(2) For alternative *units*, we may test multiples of the status quo by asking "twice as much as now?" "half as much as now?" and so forth.

(3) For alternative *indices*, we may test goals classified by:

> (a) Institutional indices, *e.g.*, per cent of gains in health, welfare, education, income rates, and so forth;
>
> (b) Problem indices, *e.g.*, armament cuts, inflation control, desegregation, and so forth.
>
> (c) Historic concepts, *e.g.*, freedom, prosperity, equality, peace, and so forth.
>
> (d) Budget categories, *e.g.*, Defense Department operation, crop price supports, foreign aid, research, retiring the debt, and so forth.

(4) For alternative *levels*, we may compare and test frequencies, means, variances, correlations, and other orders of statistical moments.

## The Functioning Of Aimscales
## Three Criteria Of Calibration

An aimscale must meet three functional criteria; if it is to work well in practice as a measuring instrument it must be highly reliable, valid, and causative. A *reliable* aimscale will correlate highly with itself on repetition. By repolling shortly after the initial poll one measures "retest" reliability. By repolling in a second representative sample from the same population one measures "resampling" reliability. And by using differently phrased versions of the same questions, one measures "rephrasing" reliability. Similarly, by varying the pollers one can measure errors or unwanted variation in the measuring instrument due to different pollers.

A *valid* aimscale will correlate well with other indices of the goals, means, or results in a given situation. Thus an aimscale which found that a city's residents, when polled, favored a goal of more funds for schools or parks would be validated if a referendum for raising such funds were passed in a subsequent election. To some extent an aimscale based on subjective ratings may be validated by its correlation with more objective statistical indices. This is only partial validation, however, since the ratings reflect the citizens' opinions and not necessarily the facts. But it is these *opinions* of citizens and leaders and experts that guide every nation, with whatever accuracy of perception its decision-makers may have.

A valid aimscale would also be a predictive one if there were an appreciable time lapse between the poll and the confirming event. For example, an analytic poll of Congress could predict, and by feedback help to establish, the features of a projected bill setting up a program to a goal (such as doubling our annual production of new Ph.D.'s). The aimscale would be predictive of Congressional action if the bill were enacted, and it would predict national action insofar as the enacted program proved effective in producing more Ph.D.'s.

An aimscale could be validated more roughly by expert appraisal, perhaps combined with further explicit endorsement of the scale by the electorate and its officials.

Thus alternative aimscales could be rated in terms of their comparative completeness and practical feasibility for guiding full and balanced national progress.

A *causative* aimscale is one measuring goals and means in which the means can be shown to "cause" the goals to some statistically significant extent. Such proof would require significant correlation between manipulated changes in the alleged cause and corresponding, subsequent changes in the alleged effect—all under circumstances that could be duplicated. A less rigorous approximation of causative calibrating is the technique of "imputing causal shares" by experts, a technique which is more feasible than actual manipulation of public affairs. A panel of judges who are specialists in the relevant behavioral science may rate what they think to be the causal correlations of changes of a given extent, other factors being equal.

In summary, the three main functions of science are to describe, predict, and control phenomena, the phenomena in this case being a nation's "value systems" or "pursuit of goals." These functions can be met by calibrating aimscales which meet certain working standards—some acceptable correlation index that is statistically significant for their reliability, their validity, and their partial causality. For exactness in description is tested in part by reliability correlations, exactness in prediction is tested by validity correlations over a period of time, and exactness in control is tested by causal correlations.

### The Significance Of Project Aimscales

The possible *social* significance of this research may be succinctly summarized by its title. It proposes research to develop scales for measuring the nation's aims. It creates a scientific instrument for ascertaining the national purpose periodically, comprehensively, precisely, and democratically.

The project will provide improved and improvable means for *periodically* reassessing America's goals. It thus can help to keep our perennial pursuit of goals timely and vital. It can help shift the emphasis of national effort from historical goals which are largely achieved (though they need to be protected against threats), to emerging problems that currently call for our greater effort.

The project will provide improved and improvable means for dealing *comprehensively* with the whole spectrum of the nation's aspirations and objectives. For it can report to the nation in a single document as full a current inventory of national ends, and means thereto, as the nation may want to compile. It can help replace partial or piecemeal attempts to attain goals with more systematic and complete efforts.

Aimscales can be continuously improved by further research to determine ever more *precisely* just what goals the nation wants to pursue. Aimscales of the future will be able to measure all aspects of goal-pursuit more accurately than the less exact aimscales, whatever they have been called, of the past. Aimscales of the future will be able to measure with increasing precision the sizes of the itemed target ends, and subtarget means thereto; their costs in terms of man-hours of effort, money, alternatives displaced, or other appropriate terms; their scheduling in regard to any needed regional differentials or adjustments for diverse conditions; and the all-important attitudinal dimensions of the citizens and their leaders—their strength of desire, clearness of vision, and potential skill in execution.

Aimscales can improve the *democratic* pursuit of goals. For through its representative polls-in-depth, all citizens and their leaders can take part in choosing the goals and the programs thereto. The individual's preferences and efforts and satisfactions can thus be taken into account in due proportion toward practicing the theory of democracy. In brief, Project Aimscales seems to us to be a small but essential step to help accelerate full and balanced national progress.

The *scientific* significance of Project Aimscales is also implied by its title—it proposes to scale the aims of the nation. It is an early and necessary step in developing measuring instruments in the sciences of human behavior and its subscience, axiology—the study of values and goal-pursuing behavior. In particular, it will start calibrating and standardizing a universal equal-interval scale for human attitudes. The seven-point

# *Topics and Critiques*

## Prejudices and Data in Government Forms

The New York State Commission Against Discrimination is skating on thin ice. It has set out to eliminate or control questions about race, color, creed, national origin, and age in official papers in New York State. The agency is required to act by an order of Governor Rockefeller promulgating a code of fair practices for the executive branch. Article Seven of the code states, "All state agencies shall avoid in forms or requests for information any item or inquiry expressing any limitation or specification as to race, color, creed, national origin or age, unless the item or inquiry is expressly required by statute or is required in good faith for proper purpose and prior notification of its use has been given by the agency to the State Commission against Discrimination."

Dr. John Bushnell, Director of Research for the Commission, is acutely aware that the facts at issue can serve not only persons seeking to humiliate or discriminate unwisely, but also many social scientists, government planners, and officials. The problem is important in that two currents which are believed to be progressive, one aiming at conserving privacy and fighting racism, the other aimed at increasing the flow of data about the population for behavioral science, clash in opposition. The solution will probably take the form of a double entry system, public facts going through one channel and scientific facts moving in another.

## C. P. Snow on the Role of Scientists

C. P. Snow, who was a natural scientist and British bureaucrat before and while he was a novelist, has been appearing at Harvard and in New York City with messages on science and society. Dr. Snow is urging that scientists move closer to the top level of decision in government. One respectable role, he says, is in open political disputation, as exemplified by Lord Cherwell, who supported Winston Churchill in the latter's fight to make the British government aware of Hitlerian strength. A second role would be filled by scientists as secret advisors or deciders. These scientists should have a prominent place in making crude decisions about living or dying, cloaked in the secrecy of national security. They should be at the top level too in the naturally secret realms of the oligarchy of decision-makers in a highly complex social setting. Unfortunately, Dr. Snow does not explain *how* to integrate scientists into policy-making. Good will on the philosopher-king problem is not enough. Perhaps the fact that one out of four Americans is now attending some sort of school would indicate a new and more august role for scientists and scholars. For gaining and holding political power, there is nothing so effective as a large constituency.

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rating scale described above can be applied to any attitude continuum that can be represented in the statement, "What is your opinion about X?" It need not be specially scaled and calibrated for each particular attitude as is necessary in all Thurstone and Guttman scales thus far developed. In recent testing, our laboratory has found that the seven-point rating scale is markedly more reliable and valid than the conventional Guttman scales of the same attitudes.

With this universal and calibrated attitude scale in hand, many methodological and substantive hypotheses may be formulated and tested more operationally than was possible with scales of lesser universality, reliability, validity, and causality. We have a long list of such hypotheses which await testing.

### Campaign Literature Grabbag

Nowhere does the hypocritical side of mass democracy show up so badly as in the life cycle of campaign literature. Pamphlets, brochures, leaflets, and flyers are printed by the millions with the utmost gravity and a candor frequently lost in the post-election scene. Practically all examples of such propaganda are destroyed immediately after the election. It is hard to conceive of any material that librarians hold in greater contempt. Yet here are the raw data of a central area of political concern. It seems that only in archeology and medieval studies are the humdrum artifacts treasured. When a class of ours was set to work to trace various themes through California campaign materials going back to the early days of anti-Chinese agitation, we found very little left of two generations of hot agitation on many subjects, yet the few pieces we found were most revealing.

We are getting around to congratulating the Citizenship Clearing House for persuading two political scientists at the Republican and Democratic Committee Headquarters to ship surplus packets of fugitive literature to 800 teachers of American politics and government around the country. Some of it will find a haven on library shelves. But we regret that a great search has not yet been launched for such surviving material for any and every American election of the past. For content analyses of political images, political style, regional and local differences, and numerous issues, such a collection would be worthwhile.

### Plan for a New Encyclopaedia on Social Science

The Free Press and the Crowell-Collier Publishing Company will jointly produce a new encyclopaedia of social sciences. It has been a generation since MacMillan, now a subsidiary of Crowell-Collier, published the original *Encyclopaedia of the Social Sciences,* and dated thought it is many scholars and teachers still use it as a basic reference or for classroom reading. Chairman of the Editorial Board for the new project is W. Allan Wallis, Professor of Economics and Statistics and Dean of the Graduate School of Business at the University of Chicago. Plans call for drawing upon contributors from around the world. Incidentally, UNESCO is still struggling to produce a dictionary of terms in the social sciences. A report on both projects will be made by *ABS* in a coming issue.

### Foundations Mining Low-Grade Ore

Though the larger foundations may often be exceptions, much foundation money goes for projects that duplicate public expenditures or to lengthen the duration of private charities. At worst, they allow individuals to control money that might better be given to universities or given over to the government on an equal basis with other taxpayers. The larger foundations themselves are poised between spending money for practical ventures and low-grade technical aid and educational projects at home and abroad, or, on the other hand, contributing to the drive for "pure knowledge."

In our opinion every cent to spare should go to shore up and develop our cultural and scientific structure. On a few millions of dollars depends the whole world's scientific and intellectual progress. Never has the world been more endangered by the paucity of the men who must judge and who must use its scarce intellectual resources. As an example, we noticed at the December conference of UNESCO in Paris that millions of dollars were being diverted into bread-and-butter projects, for example, technical assistance, basic education programs, and mass information campaigns. Yet the *Museé de l'Homme* stands in Paris with half-used capacity and a proven record of distinguished contributions to anthropology.

The larger foundations must resolutely put aside their "Red Cross disaster" functions and shut out the immediate pleadings, otherwise pitiable, of the masses who need education and material goods, and of the thousand colleges that need teachers on all kinds of subjects. They should distill out the most pure, essential, and general ideas, and support those persons around the world who can do most to keep the ideas alive and moving.

### On the Uses of Jargon

The other day we were reading an article on the detection of developmental deviations in children. We noted a bit of jargon and somehow stuck on it, although we are hardened to the peculiar languages of social science. Following a remark that children were examined alone was this passage: "Some interpretation of the findings were given to mothers who expressed a wish for this, except in cases when it appeared contra-indicated . . ." Now why "contra-indicated"? At first glance it seems absurd. It abuses the English language, lends a false scientific air to the authors, and deludes the reader into believing that something new has been added when it really has not. Then, on second thought, we discovered a purpose that, though probably unconscious, must be common in social science jargon. The authors thereby flag a word to indicate that they are operating purposively. If they used "unwise," it would appear too unsystematic. They are trying to say that they were exercising systematic controls over the process of *non-informing*. Maybe there are better ways of handling the problem, but we cannot dismiss this kind of jargon as wholly without utility.

### The Tricky Word "Is"

Semantics and elementary logic—herein lie most of the problems of social science. Even in the most renowned and respected writings, "is" is used for "ought" and "should," and it is of little avail to say so to oneself, to one's students, or to the public. It takes superhuman courage for an author to adopt a practice that he will immediately admit to be the correct and just one. We may cite several respected works with which we have been lately concerned; we have in mind W. W. Rostow's study, *The United States in the World Arena,* where the national interest typically "is" (not "should be" or "ought to be") something that Rostow or somebody else likes. Again, the panel study of the Rockefeller Brothers Fund dealing with the present and future of democracy consistently affirms that democracy "is" something or the other when most patently it is, if it is at all, only in the bare majority of cases. One need simply substitute the word "should," or "ought," wherever the word "is" is used in the evaluative or preferential sense to see how weak and miserable many a passage becomes, a passage which may cry out with sureness and all the weight of history and human nature. Unfortunately, in our positivistic age we hate preferences and we immediately lose respect for any statement that appears to be conditioned by what is desired rather than by the hard facts of life. This one abuse alone promotes chaos in the social sciences and in commentary on social problems. Yet it is universal, and condoned. Probably it is even taught in some places as good journalism.

"Vice is a monster of so frightful mien,
as to be hated needs but to be seen;
yet seen too oft, familiar with her face,
we first endure, then pity, then embrace."

### The Cultural Boom in the U.S.A.

Father P. J. McNasty writes in *America* that more than twice as many people visited the Metropolitan Museum of Art as watched the Yankees play ball at Yankee Stadium last year. Twice as many visited the Metropolitan as did the Louvre, even when the Americans who crossed the ocean to see the "Winged Victory" are included. More visited the Detroit Museum than the British Museum. There are 1,142 symphony orchestras, more than half of the world's total, in the United States. Over 50 non-commercial educational stations cover the nation's cities with T.V. programs, and 1,912 new paperbacks were issued in a year. All of this consumption must be putting on some mental weight. But how do we distribute this weight properly? It is well that millions are for the first time taking in the arts and sciences, but it is still true that to read (or hear, or see) and understand one good work well is far superior to consuming a hundred good works without joy and understanding.

# A History of Measures

*by* Livio C. Stecchini

*Dr. Stecchini, who related the original alphabet to a prior numerical divining system in the February issue of ABS, here summarizes the results of research on the origins of measures. The world's measuring systems probably have a common root in ancient Mesopotamia. In some cultures they were endowed with a religious aura; in Greece they gave rise to the dispute between Protagoras, that "Man is the measure of all things," and Plato, that "God is the measure of all things." In the modern world, a number of theoretical misconceptions arise because scientists and humanists have forgotten the true nature of measure.*

### The Nature Of Science

Science is a process consciously directed toward achieving knowledge that is explicitly formulated, general in scope, systematically ordered, and dependable. Since Kepler and Galileo, dependability has been based on testing by measurement. Thus, physics became the queen of the sciences because of its consistent determination to introduce measurement into its discussions at the very earliest stages.

Modern science began when Galileo introduced the distinction between primary and secondary properties; primary properties are those that are measurable. Hence, science today is the art of formulating general statements that are verifiable by measurement. The precision of the measurements involved is the standard of the probable truth of a scientific theory.

Philosophers of science have recognized that this conception of science may be traced to Plato. But the historian must be concerned with the context from which Plato's formulations developed. The most radical statement of all Greek thought comes from Protagoras: "Man is the measure of all things." Werner Jaeger observes that Plato's philosophy could be summed up in one sentence, intended as a reply to Protagoras: "God is the measure of all things." The two philosophers disagreed on the metaphysical foundations of measurement, but they agreed on the proposition that measure is the ultimate reality—for the claim of God or man to be the ultimate reality depends on their connection with measure.

Thus, in tracing the origins of science the question of the origins of measure arises. It is important to know how the Greeks operated empirically in the matter of measurement. The Greeks had a scientific system of measures connecting length, volume, and weight, but they did not invent it.

### The Development Of Measures

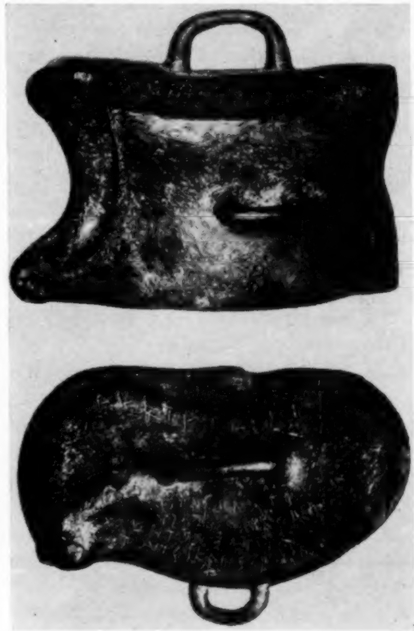
All evidence points to the conclusion that the Greek system of measures was developed in Mesopotamia before the origin of writing, before 3,000 B.C. In fact, an extensive survey of the archeological and written evidence for the near East and Europe, including Russia, indicates that all units of length, volume, and weight can be derived by a few simple arithmetical rules from a single lineal standard, the so-called Egyptian foot of 300 mm. There is *prima facie* evidence that the same results would be obtained by examining the evidence from China and India.

This system was maintained in early Mesopotamia and Egypt, and after millenia of diffusion, existed in medieval Europe. It continues today in the English units of measure. The English pound, for example, has not changed by a grain since the fourth millennium B.C. Units of length similarly have been maintained unaltered, varying less than one one-hundredth of a millimeter over 5,000 years. All this demonstrates that the concern with precision of measurement in the ancient world went beyond any immediate practical utility. Even the geometry of Mesopotamian, Egyptian, and Greek buildings shows a concern with setting diagonals with a precision that is irrelevant to the architectural requirements of construction.

The inner structure of the ancient system of measures, in which a fundamental element is the scaling of the units in order to take into account the specific gravity of wheat and barley, suggests that measurement became important when agriculture was "invented" in the area extending from Syria to Iran. Probably it was in the wake of agriculture that a single system of units spread East and West. As soon as farming became the main source of sustenance, it proved necessary to know how to distribute supplies from one harvest to the next. Myths associate the establishment of measures with a famine. (And William Blake evoked a theme of the ancient past when he formulated the proverb, "Bring out number, weight, and measure in a year of dearth.") But the stimulus to the establishment of extremely precise standards came from the use of gold and silver as means of exchange, and from the need of astronomy, which was then concerned with astrological predictions.

The steptower in the center of Mesopotamian cities, for example, embodied the units of the system of measures and represented the connection of the cities with the cosmic order. The Egyptians had measured the circumference of the earth and realized that degrees of meridian become longer as one moves to the north. They established a geodetic system with benchmarks, for the purpose of showing that the main physical features of Egypt fit the patterns of meridians and parallels. And when they sought a site for their capital at the beginning of the Middle Kingdom, they chose Thebes, which is located at two-sevenths of the distance between the Equator and the Pole.

The concern with measures also characterized the Renaissance. One of the first systematic bibliographies ever printed deals with works on measures. By the age of Galileo there had appeared at least fifty major works dealing with ancient measures. Though Galileo did not write on units of measure (Kepler did), many of his correspondents wrote on the history of measures. Among his antagonists, Father Riccioli dealt with Roman measures and Father Grienberger with Hebrew measures. The French metric sys-



In 494 B.C. the Persians sacked the Greek city of Miletos on the coast of Asia Minor and removed this huge bronze weight from the city's famous temple of Apollo. The weight, excavated at the Persian capital, Susa, is now at the Louvre in Paris. It was cast in the shape of a knucklebone, with handles for lifting; weights often had the shape of knucklebones, which were used as dice, because the ancients associated measures with the notion of probability.

This weight is described by a curator of the Louvre as being 93½ kilograms, closely equivalent to a standard of 3,000 English ounces Troy, or 93.312 kilograms. It can be compared with a standard weight manufactured by the Persians in the same period of time, a bronze lion found at Abydos in Egypt and now at the British Museum in London. This weight is reported to weigh 68 lbs., 2 oz. avoirdupois (30.901 kilograms); a small piece of it is missing. It originally weighed one-third of the knucklebone of Miletos or 1,000 English ounces Troy—31.104 kilograms.

tem did not derive from a desire to innovate, but from plans formulated in the course of two centuries to reform ancient measures by making them consistently decimal, as they already were in part.

### Measurement And Religion

Because of their connections with social justice and because of their connection with astronomy, measures acquired a transcendental meaning The care needed for precision contributed to creating a religious atmosphere around them. Measures were preserved in temples (and in medieval churches), both because thereby they would be protected as holy and because it was felt that there was something holy about them.

This was the case with the Hebrews, for example. Maimonides observes that according to Jewish tradition, the use of false measures is a crime worse than incest. A number of passages from the Old Testament make clear that the first element of Hebrew law is the system of measures. They are connected with the statements that God created the world *numero pondere mensura;* these texts were quoted with gusto by thinkers of the Renaissance. The Ark of the Covenant, where God was present, was nothing but an empty box representing a standard unit of measure. In some Greek temples too the divinity was represented by a unit of measure that was carried in procession on given occasions. The Brazen Sea and the other measures of the Temple of Solomon expressed the same notion; Jewish tradition perserved with great care the *middoth* of the vanished temple.

Even in the Dark Ages, Germanic tribes continued the ancient custom of placing an instrument of measurement in tombs.

### The Greeks: Measurement And Society

In Greece, the concerns with an organized system of measures and with the conception that the world was constructed *numero pondero mensura* was taken over in the seventh century B.C. The source was apparently the Near East, for it can be shown that phrases of Greek inscriptions dealing with measures are translated from a Semitic language. But among the Greeks the importance of measurement acquired a new dimension, because of their invention of the coin; they felt that monetary economy mathematizes human relations since, as Marx puts it, the bond among human beings becomes the cash nexus.

A number of fundamental texts that have been either ignored or declared puzzling, make clear that the Athenians considered the system of measures the essence of their democracy. Democracy involved a mathematization of the constitution. It must be kept in mind that by democracy they did not mean anything resembling our representative institutions; rather, Athenian democracy with its system of cross-sections, fair samples, and lotteries had features similar to those of our social statistics and public opinion polls. The revolt against mathematization and measurement, represented by Aristotle, is connected with the opposition to democracy. Up to now one of the most important parts of Aristotle, the discussion of justice in the Fifth Book of *Ethics*, has been badly understood; in it he criticizes the democratic conception of arithmetical equality and, at the same time, the mathematical interpretation of money and the notion that money is the essence of law, in the sense of being the fundamental determinant of human relations.

### Science And Measurement

The history of measure also has much to say about the nature of science. It has been objected that the reduction of science to measurement makes the world dry and dull, and stifles human creativity. The fallacy is based on a misconception of the nature of scientific theory; it is the insistence upon measurement that makes the construction of scientific hypotheses a field free for human imagination. One could hardly accuse Plato of being an opponent of imagination, yet he declares that if number, weight, and measure are taken away from a discipline, little or nothing remains. Echoing some words of Bacon, it may be said that science consists of "anticipations, rash and premature" and of "prejudices"; but these marvelously imaginative and bold conjectures are carefully

and soberly controlled by systematic tests.

It is also a common misconception that science results from the accumulation of perceptual experiences in the course of time. For this reason many find it difficult to explain the progress of science in Greece. It would actually seem that science advances in the periods in which human imagination is particularly stimulated. The outburst of science in the Renaissance is connected with the rapid development of the arts and letters. Needham maintains that the technology of the Italian Renaissance was inferior to that of contemporary China. As the origin of specific theories in the Renaissance is investigated, their connection with neo-Platonism, Pythagorism, Cabalism, and mystical doctrines becomes apparent. Karl B. Popper has observed that the fallacy of deriving science from the accumulation of perceptual experiences leads to the superstition that science is bound to advance, since our experiences are bound to accumulate. This leads in turn to a deterministic conception of history which implies that science can progress under totalitarian regimes. Science in fact depends upon the free interplay of thought and hence ultimately upon freedom. It thus seems that those who stress the role of measurement in science are the true friends of humanism, of those artistic and literary pursuits that increase the range of human imagination. The Newtonian conception of space has its roots in the mathematical perspective in the painting of the *Quattrocento*, which in turn was influenced by Pythagorean tenets. It is not accidental that Galileo was the son of the author of an important treatise on Greek music, and it can be shown that this treatise had a direct influence on Kepler.

The problem of the relation of science to the humanities is discussed by Husserl in his final work, *The Crisis of European Science*. He stresses the importance of knowing the genetic relationship between the practice of metrology and the mathematical conception of the universe. Because this relationship has been forgotten the scientific universe appears a reality independent of the mind of man, a monster that would crush humanity. For the Greeks, science was the product of the rational attitude of man, an affirmation of the human mind: the *logos* discovered in nature is the human *logos*. This is the essence of humanism according to Husserl. The history of measures reveals man's option in specific historical circumstances to interpret the world in mathematical terms (*Wille der geistigen Vorväter*).

This investigation is concerned with the gathering of empirical data and with pursuing the minutiae that provide the proper evidence for a history of measurement; but it cannot help having some bearing on the conflict between realists and instrumentalists in the interpretation of scientific heories. Most modern instrumentalists have been motivated by an irreverent frame of mind and have aimed at destroying ontology; for this reason they have not seen that, in denying the connection between being and scientific theories, they transferred being to measures themselves. On the other side, the realists have tried to hold on to being, but have not seen that the source of the ontological force of scientific theories is measurement. Ancient thought had gone a long way in this direction. The Renaissance view is expressed by Guillaume Budé, the founder of Greek studies in France, who in 1514 A.D. published a monumental study of ancient measures for the purpose of reestablishing the coherence of the units that had been shaken by medieval practice; he prefaced it with a motto that equates measures to religion:

*Una fides, pondus, mensura sit idem,*
*Et status illaesus totius orbis erit.*

"Let there be one single faith, one measure, one weight, and the order of the world shall be free from harm."

# Some Non-programmatic Dimensions of Parties

*by* John H. Kessel

*The author's role as an activist in the recent Presidential campaign leads him to suggest some factors which, though they may have little to do with policy, seriously affect party leaders' decisions. Mr. Kessel teaches in the Deparment of Political Science at Amherst College.*

As the language of political commentary has shifted from romantic idealism to systematic analysis, the meaning of the left-right distinction in politics has been reduced from a parliamentary seating arrangement to points on a continuum. Two themes run through the current discussion. The left-right distinction, whether used as conversational allusion or as spatial abscissa, is a useful device for orienting political thought. But a single liberal-conservative spectrum so oversimplifies political reality that it leads to confusion.

H. J. Eysinck has suggested modification of the one-dimensional radical-conservative continuum by including a democratic-autocratic continuum as an ordinate (in *The Psychology of Politics*, New York: Praeger, 1955, Chap. 4). Anthony Downs has proposed some ingenious applications of the Hotteling-Smithies spatial competition model to account for such situations as expansion of the electorate and multi-party systems (in *An Economic Theory of Democracy*, New York: Harper, 1957, Chap. 8). And David Butler has shown what can be done by including "centers of gravity" in one's analysis (in "The Paradox of Party Difference," *American Behavioral Scientist*, November 1960, pp. 3-5).

These analyses are particularly useful in illustrating the dilemmas confronting party leaders when making their decisions about campaign strategy. If Party A moves in the direction of Party B, the voters may well decide to support Party B on the grounds that Party A offers no real alternative. If Party A moves toward the extreme end of the continuum it cannot appeal to middle-of-the-road voters. But the practical problems confronting party leaders are much more complex than this. These dilemmas can be illustrated by including some non-programmatic dimensions in the analysis.

### Party Identification

In the first place, the voting tendencies of the electorate cannot be described primarily in policy terms. There is abundant evidence that a voter's party identification tends to persist for some time after changes in party policies or after the voter's viewpoint makes such behavior "irrational." It is also clear that voters who have a personal history of support for one party and a sympathy for the policy views of the other tend to vote independently because of the cross-pressures acting on them. Now what course should be followed by party leaders who wish to attract independent voters? Does the "historical" or the "policy" dimension offer them more hope of winning the election? Should they shift their policy positions to keep the allegiance of their erstwhile supporters, dramatize their current policy statements to attract those who agree with them, or cautiously refrain from either of these courses in the hope of winning votes from both "independent" blocs?

### The Internal Distribution Of Party Power

Now let us assume that a group of party leaders has decided that Party A should try to appeal to a more liberal group of voters. Let us further assume that they have decided that a way to do this is to give special support to State Senator Smith, an intelligent young man with a liberal voting record who has won his party's nomination for Governor. The revelation of these plans — whether by public announcement of a Citizens for Smith

group or by private dissemination through party gossip channels — will produce a mixed reaction. Some people will welcome a Citizens for Smith organization as a vehicle for attracting a group of voters which the party *as party* could not reach; others may attempt to strangle it at birth because it will compete for the available resources of campaign finance and political talent. And these reactions usually are inversely related to the amount of effective political power exercised by the persons concerned. The men who are in firm command of a strong party organization are likely to welcome the group as a sign of party vitality. Those who precariously retain leadership positions in a weak party frequently regard the new effort as a rival to be thwarted. Therefore, the distribution of effective power within the party is another dimension which must be considered.

### Social Stratification

The third non-programmatic dimension is that of social stratification. The critical point on this continuum is the stratum with which State Senator Smith and his immediate supporters are identified. Ideally, the candidate's background and personality should enable him to move with ease in a wide variety of social settings, and his advisors should represent all of the strata with substantial party memberships. Frequently, though, the candidate is either an aristocrat or one whose politico-economic ascendancy has not been accompanied by the acquisition of social graces. It is also likely that the compatibility which led the party leaders to counsel together and back Senator Smith was based in part on similarities in social background. This can lead to comments such as an aloof "That man simply is not the type of person *I* am accustomed to associating with," or a muttered "Jeez, he loses us 5,000 votes every time he opens his mouth." Such disparity in social background not only reduces the number of persons who can be recruited to the candidate's banner, but creates latent antagonisms which will flare into the open if the campaign does not appear to be progressing well.

### Willingness To Work

Each of these dimensions is of value to the political scientist, because it suggests a factor which is important to the understanding of party organization. Each may cause trouble for the political leader, however, for each dimension represents another possible division within his ranks. But let us assume that the supporters of Senator Smith have been fortunate: they have located persons whose policy views are as liberal as those of Senator Smith, whose personal political histories reveal records of support for Party A, who enjoy friendly relationships with strong leaders in Party A and hence are free to embark on an "independent" venture, and whose social backgrounds are such that they are at ease in Senator Smith's presence. Often all of this good fortune means little because of a fourth non-programmatic dimension: willingness to work. In many cases the persons who appear to be natural supporters of a given candidate lack either the time or the inclination for exhausting campaign activities. The number of reliable lieutenants and workers in most parties is quite limited. This has two effects. Since the number of willing workers is finite, the observer does not have to contend with a random distribution of party activists along all of the dimensions which have been discussed. But since political leaders can ill afford to lose the workers they do have, this serves as yet another check on the leaders' ability to embark in new policy directions.

The real dilemma of the party leaders is having to reckon with the simultaneous interplay of all of these factors. The real paradox is that they are frequently prevented from implementing policy decisions by factors having nothing whatsoever to do with public policy.

# *New Studies in Behavioral Science and Public Policy*

***These items are selected and annotated by the ABS staff in a periodic search of new issues of 250 journals and reviews, including about 100 that are published outside the United States, and from announcements and review copies of books and fugitive materials recently published. Some items of special interest are boxed.***

AGNEW, P. C. and F. L. K. HSU, "Introducing Change in a Mental Hospital." *Human Organization*, XIX (Winter '60-'61), 195-99. Resistance is to be expected when an innovation is introduced into an organization, but it can be reduced "if the American culture pattern of equivalence between self-reliance and self-respect is taken into consideration. . . . A balance between maximized feeling of independence and the need for enforcing policy and authority is the most essential part of administrative technique in American society."

ALBERT, R. S., "Stages of Breakdown in the Relationships and Dynamics between the Mental Patient and his Family." *Archives of General Psychiatry*, III (Dec. '60), 130-38. A three-stage model for observation and interpretation of the "increasingly maladaptive and systematized behaviors . . . to which the mental patient and his family seem so prone."

BALANDIER, G., "The French Tradition of African Research." *Human Organization* XIX (Fall '60), 108-11. The development of institutional research prior to WW II continues; basic, "mixed," and applied research is currently being conducted by at least a dozen organizations located in France and/or Africa.

ANDERSON, T. R., and S. WARKOV, "Organizational Size and Functional Complexity: A Study of Administration in Hospitals." *Amer. Soc. R.*, XXVI (Feb. '61), 23-28. Contrary to previous findings, relative size of the administrative component *decreased* as organizational size increased. Suggests that the relative size of the administrative component decreases as size increases; increases as the number of places at which work is performed increases; and increases as the number of tasks performed at the same place increases.

BAMBERGER, M. A., and N. LEWIN, "The Right to Equal Treatment: Administrative Enforcement of Antidiscrimination Legislation." *Harvard Law R.*, LXXIV (Jan. '61), 527-89. The unique function of governmental anti-discrimination commissions, legal and procedural problems they meet in practice, and techniques used to solve them; "the effectiveness of at least those commissions not denied all power of enforcement depends less on the minute details of their statutes than on the efforts of commission members and staff to make full use of their express and implied regulatory authority."

BANTON, M., "Social Distance: A New Appreciation." *Soc. R.* VIII (Dec. '60), 169-83. Reviews recent work using the Bogardus social distance scale, asks that data be published so that "anamolies in the ranking relationships are apparent," so as to facilitate reanalysis; also asks further use of the scale in studying relations between social classes and occupational groups, etc.

BEERS, H. W., "Program Evaluation in India." *Rural Soc.*, XXV (Dec. '60), 431-41. Outlines the work of the Indian government's Program Evaluation Organization, which continually evaluates educational effort, program action, and community development in general; it has had marked influence on policy, programs, and methods.

BERGMAN, H. J., "Law as an Instrument of Mental Health in the United States and Soviet Russia." *U. of Penna. Law R.*, CIX (Jan. '61), 361-76. Each social function of law has a corresponding psychological function for the individual member of society. In Russia there is close cooperation between psychiatry and law, underlying which is conscious conditioning of emotions, attitudes, and belief; we should match the Soviet cooperation but also "we should attempt to build into our law and into our psychiatry a conception of man which is more complete and more balanced than the Soviet conception."

BESTOR, A., "History, Social Studies and Citizenship: The Responsibility of the Public Schools." *Amer. Phil. Society Proceedings*, CIV (Dec. '60), 549-57. "Democracy rests upon the free exchange of opinions. It rests, no less, upon the patient, methodical, rational accumulation and utilization of knowledge. The American public school must teach respect for both. It cannot do so by confusing one with the other . . . The free expression of opinion is no substitute for the acquisition of precise knowledge."

BIDERMAN, A. D., and H. ZIMMER. *The Manipulation of Human Behavior.* N.Y.: Wiley and Sons, 1961, $7.95. Seven research memoranda on some late concerns of behavioral science and public policy, stemming partly from military studies. "The unwilling subject" is generally the theme. The role of physiological state of the subject, sensory deprivation or delusion, use of drugs, evaluation of physiological responses, use of hypnosis, and interpersonal influences are dealt with. Many defense mechanisms available to subjects are explored. A valuable book, spanning numerous areas of theory and application relevant to all social science.

BIRD, C., "Soviet Ethnography: A Base for Applied Study of and Operations in Africa." *Human Organization*, XIX (Fall '60), 118-22. A review of Soviet ethnographic policy, publications, and research; they have an avowed double purpose, scientific and political.

BONNAUD-DELAMARE, R., "Le problèm de la région en tant que circonscription administrative." *Intl. R. of Admin. Sci.*, XXVI (#3, '60), 269-78. Reviews French experience with the small *départements* and continuing but thus far ineffectual attempts to establish broader, regional administration. Technical advance will inevitably lead to wider administrative structures.

BOUSQUET, G.-H., "Quelques remarques sur une question fondamentale négligée de la science économique." *Giornale degli Economisti*, XIX (Jan.-Feb. '60) 26-44. Some psychological questions at the root of economics, *e.g.*, the human valuation of money, questions of utility, individual differences in satisfaction, and so forth.

BUCKINGHAM, W. S. *Automation.* N.Y.: Harper, 1961, $4.50. A general treatment of its social and economic consequences, for the individual and for the firm.

CANTRIL, H., ed. *The Morning Notes of Adelbert Ames, Jr.* New Brunswick: Rutgers U. Press, 1961, $6.00. The memoranda of an outstanding perceptual psychologist clarifying his thinking and investigation into the "seeming" by which men live and relate themselves to the fundamentally unknowable world of assumed "reality." Behavioral science has too little of this type of autobiographical-philosophical material, which can as here richly assist the theoretical process and also provide data for the study of the twentieth-century mind working on scientific matters. Contains exchanges with J. Dewey and others.

CAPES, M., and A. T. M. WILSON, eds. *Communication or Conflict.* N.Y.: Association Press, 1960, $4.00. Papers on the nature, dynamics, and planning of conferences, focussing on problems of communication when confronted with cultural and national barriers.

CARTER, H., "Plans for Improved Statistics on Family Formation and Dissolution in the United States." *Social Forces*, XXXIX (Dec. '60), 163-69. Samples of marriage and divorce records since 1960 have been obtained from State and county offices for national tabulation, to remedy deficiences in the prior method of simply consolidating tables obtained from State offices.

CHAKRAVORTY, S. P. R., "Panchayat Elections and Casteism." *Econ. R.* (New Delhi), XII (Nov. 22, '60), 39-41. The development and extent of the Panchayat (village council) system of decentralized democracy, and an election procedure to keep it relatively free of caste influence.

CHEJNE, A. G., "The Use of History by Modern Arab Writers." *Middle East J.*, XIV (Autumn '60), 382-96. Modern Arab historiography bears the imprint of nationalism. "It aims at the diffusion of an historical consciousness through the revival of the past and the glorification of its heroes and accomplishments. History has been approached with a definite orientation for improving the present and setting firm foundations for the future."

"The City of Socialist Man." *East Europe*, X (Jan. '61), 3-16. Surveys the towns and cities of Eastern Europe, often through the eyes of their inhabitants and critics, who find them "swollen like yeast." In general, they are "characterized by overcrowding, discomfort, and ugliness. Transportation is overburdened, public utilities inadequate, housing and consumer service woefully short."

CLARK, J. V., "Motivation in Work Groups: A Tentative View." *Human Organization*, XIX (Winter '60-'61), 199-208. Factors which both release and constrain different motivations of members of industrial work groups. Finds that, according to Maslow's need-hierarchy theory, relative satisfaction of certain needs may release other needs which alter the picture.

COHEN, K. J., *et al.*, "The Carnegie Tech Management Game." *J. of Bus.*, XXXIII (Oct. '60), 303-21. A business game whose complexity and realism approach those of decision-making in an actual firm; it is designed to sharpen skills of information processing planning, and individual interaction, also has research possibilities.

COLLINET, M., "Saint-Simon et la Société Industrielle." *Contrat Social*, IV (Nov. '60), 340-47. Reviews Saint-Simon's thought on social class and hierarchy, conditions of social stability, the development of a planned society, resolving man's desire to dominate other men, etc.

COOMBS, C. H., and D. G. PRUITT, "Components of Risk in Decision Making: Probability and Variance Preferences." *J. of Ex. Psych.*, LX (Nov. '60), 265-77. An alternative to the "maximization of expected utility model" for money, tested by placing subjects in a gambling situation.

"Current Preoccupations of Social Research in Poland." *Intl. Labour R.*, LXXXII (Nov. '60), 464-83. Surveys the flourishing of theoretical and empirical sociology in Poland prior to WW II, finds that the demographic and political upheavals experienced by Poland during the last 20 years have offered her sociologists new fields for useful work. The outstanding feature of current Polish sociology is its essentially practical approach to social problems—changing class structure, social and human problems in industry, rural change, housing, leisure, and cultural life.

DEXTER, L. A., "Where the Elephant Fears to Dance Among the Chickens." *Human Organization* XIX (Winter '60-'61), 188-94. A case study of du Pont in politics: Delaware congressmen and senators in general seem free to choose for themselves on economic policy issues, thanks both to rifts among the many du Pont organizations on such questions and an acute du Pont sensitivity to any intimation of attempted influence on national politics and policy.

DIRKS, W., "Heilige Allianz: Bemerkungen zur Diffamierung der Intellektuellen." *Frankfurter Hefte*, XVI (Jan. '61), 23-32. Attacks the "Holy Alliance" of German intellectuals with those in power and their assumption that those in power are nearest God; this has lead to undue intellectual defamation of the "left."

DRAKE, ST. C., "Traditional Authority and Social Action in Former British West Africa." *Human Organization* XIX (Fall '60), 150-58. The tendency is not to abolish chieftancy "but to redefine the role of the chiefs and to educate them where possible, and to force them where it is impossible, to accept the redefined status. . . . In all areas, chiefs are exchanging roles of power for those of prestige."

DURAN, R. P. *Evolucion de una Urbanizacion en Bogota*. Bogota: Centro de Estudios sobre Desarrollo Economico, U. de los Andes, 1960 (paper). Comprehensive field survey of the family economics and living conditions of an urban middle class, their problems of obtaining adequate services and facilities, the need for providing and regulating such services.

EDELSTEIN, A. S., and O. N. LARSON "The Weekly Press' Contribution to a Sense of Urban Community." *Journalism Q.*, XXXVII (Autumn '60), 489-98. Studies an urban weekly newspaper as "an instrument which facilitates the integration of the individual and the group into the community structure."

FITZSIMMONS, T., *et al. USSR: its People, its Society, its Culture*. New Haven: HRAF Press, 1960, $8.50. A Human Relations Area Files survey, seventh in the series.

FLANAGAN, J. C. "Use and Abuse of Intelligence Tests." *Pub. Personnel R.*, XXII (Jan. '61), 24-28. General intelligence test items on civil service tests should be replaced in all *specific* examinations by content directed at aptitude and abilities required for each job.

FLEISHER, A., "The Influence of Technology on Urban Forms." *Daedalus*, XC (Winter '61), 48-60. The patterns of population density within a city appear largely independent of technological developments affecting occupation, transportation, or communication. Aside from the possibility of inadequate water supply, a city of fifty million is a "reasonable extrapolation."

FLOUD, J. E., and A. H. HALSEY, eds. *Sociology of Education*. Glencoe: The Free Press, 1961, $7.50. Essays under such headings as The Consequences of Economic Change, Education and Social Mobility, The Selection Process in Education, Changing Social Functions of Schools and Universities, etc.

FRUMKIN, R. M. "Some Factors in Painting Preferences Among College Students: An Empirical Study in the Sociology of Art." *J. of Human Relations*, IX (Autumn '60), 107-21. Socio-economic status, sex, age, dogmatism, and familiarity with paintings are significant factors in influencing painting preferences. On the individual level, preferences are an important guide to personality structures and dynamics; on the cultural level they suggest the intellectual climate.

FELLMAN, D., "Academic Freedom in American Law." *Wis. Law R.*, Jan. '61, 3-46. American decisional law regarding academic freedom and tenure in colleges and universities is formless and almost rudimentary, most related legislation assumes the right of States to regulate teachers and teaching content at all levels. "When American courts come to understand that the right of teachers and students to academic freedom is a fundamental legal right which is as much entitled to judicial protection as any other constitutional right, then indeed, will the cause of intellectual liberty acquire a powerful and most welcome ally."

GIBSON, J. J., "The Concept of the Stimulus in Psychology." *Amer. Psychologist* XV (Nov. '60), 694-703. A collection of contradictory usages and definitions, suggesting new categories of stimuli, *e.g.*, relevant, molar, potential, invariant, informative, etc. and asking a systematic search for them.

GLOVER, J. D., and P. R. LAWRENCE. *A Case Study of High Level Administration in a Large Organization.* Boston: Harvard U. Grad. School of Bus. Admin., 1960 $2.00 (paper). The Office of Assistant Secretary of the Air Force for Management under Eugene Zukert, 1947-51, with many specific and some general conclusions, *e.g.*, the fundamental problems of the policy-level administrator are keeping perspective—knowing what is important and what is possible.

GORER, G., "The Inventions of Man." *Twentieth Century*, CLXVIII (Dec. '60), 513-19. There have been no basic social inventions "beyond the subdivisions of the sovereign state" in the past 2,000 years yet now more than ever there is need for organized social invention, especially because the state has become extremely dangerous.

GREENSTEIN, F. I., "The Benevolent Leader: Children's Images of Political Authority." *Amer. Pol. Sci. R.*, LIV (Dec. '60), 934-43. A fresh study on the genesis of the child's attitude toward political leaders and its possible affects on his adult orientations to political authority. Children's early view of political authority is strikingly favorable; if this is tied to intimate primary group experiences it should have strong impact on adult behavior.

GULLICK, J. M. *Indigenous Political Systems of Western Malaya.* London: U. of London, Athlone Press, 1958. The internal dynamics of a socio-political system, *c.* 1870, that kept it functioning despite a high level of instability, the result in this case of the decentralization of power. "A quasi-stable system at a very low level of productivity."

HOFFMAN, R. H., and A. W. PEZET. *The Conquest of Tension.* N.Y.: Holt, Rinehart and Winston, 1961 $3.50. Causes of tension and practical suggestions for self-therapy.

HOLT, R. T., and R. W. VAN DE VELDE. *Strategic Psychological Operations and American Foreign Policy.* Chicago: U. of Chicago Press, 1960, $5.00. Proposals for fuller utilization of the psychological instrument of statecraft, with several case studies.

HOMANS, G. C. *Social Behavior: Its Elementary Forms.* N.Y.: Harcourt, Brace and World, 1960, $5.50. A set of general propositions about human social behavior.

HURWITZ, S., "The Scandinavian Ombudsman." *Pol. Sci.* (Wellington), XII (Sept. '60), 121-42. The Danish Parliamentary Commissioner for Civil and Military Government Administration describes the development, conditions, and acceptance of his task, which is "a subsequent control of all State administration." Appointed by but not a member of Parliament, he investigates public complaints against civil servants.

INGRAM, G. I. C. "Displacement Activity in Human Behavior." *Amer. Anthropologist*, LXII (Dec. '60), 994-1003. A brief account of displacement activity in animals leads to delineation of classes of human activity, particularly in work and thinking. "Man possesses powerful drives to work and to understand. Evidence is offered that the activities normally expressing these drives may be recognized in displacement in certain hobbies and in artistic creation."

KENDALL, W., "The 'Open Society' and its Fallacies." *Amer. Pol. Sci. R.*, LIV (Dec. '60), 972-89. A systematic, negative analysis of the J.S. Mill and Popper doctrines, so common as policy-science postulates. W. K. believes they should and must be avoided even though a free intellectual type is a blessing. With excellent hypotheses on the intelligentsia.

KNESCHAUREK, F., "Möglichkeiten and Grenzen der langfristigen Wirtschaftsprognose." *Schweiz. Zeit. für Volkswirtschaft und Stat.*, XCVI (Dec. '60), 399-422. The compulsion of the economist to forcast, the pitfalls, and the methods, with examples; extrapolation of trends, correlation, the "component" method, input-output methods. Suggests, *inter alia*, that the accuracy of a prediction depends often on the personal characteristics of the prognosticator.

KNIGHT, F. H., "Methodology in Economics —Part I." *Southern Econ. J.*, XXVI (Jan. '61), 185-93. Describes "a central area of inquiry which is *distinctly economics*." Economics' main subject matter is "organized economic relations in a society of free and instrumentally rational beings."

KRAVIS, I. B., "International Differences in the Distribution of Income." *R. of Econ. and Stat.*, XLII (Nov. '60), 408-16. Ten countries in comparison with the U.S.: Denmark, the Netherlands, Israel have less inequality; Italy, Puerto Rico, Ceylon, El Salvador more; Great Britain, Japan, Canada about the same. The explanation lies in specific economic and social conditions; "while early changes in economic structures bring greater economic differentiation and thus may produce more inequality than prevailed in the pre-industrial society, further economic growth . . . produces a movement toward the more equal distribution of income."

KERR, C., *et. al.*, "Industrialism and World Society." *Harvard Bus. R.*, XXXIX (Jan.-Feb. '61), 113-26. Relates different forms and paces of industrialization and their varying impact on labor and management to five different types of industrializing elite: dynastic, middle class, revolutionary-intellectual, colonial administrator, nationalists. Each seems to have its own natural pattern of evolution but there are long-run pressures for uniformity, for the development of a pluralistic industrialism —"a society which is governed neither by one all-powerful elite . . . nor by the impersonal interaction of innumerable small groups with relatively equal power."

NIKISHOV, S. I., "Marxist-Leninist Theory Must be Taught in Organic Connection with the Life of the People." *Soviet Ed.*, II (Nov. '60), 20-25. A Soviet education official states the Soviet concept of social science. A Central Committee resolution "calls upon those engaged in the social sciences to study and generalize the experience of the Party's and people's struggle for the triumph of communism, to analyze practical life and creatively to work out the fundamental theoretical problems of our time, the basic laws of socialism's development into communism." Among other present tasks are "to vigorously conduct ideological work in colleges so as to equip our cadres ideologically" and "eliminating the random choice of topics" for research.

LE BAR, F. M., and A. SUDDARD, eds. *Laos*. New Haven: HRAF Press, 1960, $6.50. Eighth in the Human Relations Area Files survey of world cultures; encompasses Laotian history, culture, psychology, economic structure, government, aims, internal conflicts.

LEE, E. C. *The Politics of Non-partisanship*. Berkeley: U. of Calif. Press, 1960, $4.75. Groups and persons in local non-partisan politics, types of campaigning, similarities and contrasts with partisan politics—based on intensive study of local elections in California.

LEVY, C., and L. HENRY, "Ducs et pairs sous l'ancien régime." *Population*, XV (Oct.-Dec. '60), 807-27. Demographic characteristics of the aristocratic society of Paris and Versailles, 1650-1800, noting especially the high rate of apparent celibacy and the marked decline in average number of children per marriage during the period.

LIFTON, R. J. *Thought Reform and the Psychology of Totalism*. N.Y.: Morton, 1961, $6.95. A study of the psychology of Chinese Communist methods of changing human personality and thought, based in part on interviews with refugees.

LILLY, J. C., "The Psychophysiological Basis for Two Kinds of Instincts." *J. of Amer. Psychoanalytic Assoc.* VIII (Oct. '60), 659-70. Physiological research on reward and punishment brain systems in animals and humans points up the necessity of two kinds of basic instinctual systems —positive and negative, loving and hating.

LITTLE, K., "Applied Anthropology and Social Change in the Teaching of Anthropology." *Br. J. of Soc.*, XI (Dec. '60), 332-47. Both applied and academic anthropologists are concerned with acculturation and social change, both require knowledge of their own society's institutions. The applied anthropologist should have "means of studying culture contact and change dynamically and as a method of predicting social process," in his own culture as well as others.

MCDOUGAL, M. S., *et al. Studies in World Public Order*. New Haven: Yale U. Press, 1960, $15.00. Essays concerned with "a contextual, policy-oriented jurisprudence," aimed at "the dignity of man in an increasing universal public order." The framework of inquiry, strategies for minimum order, strategies for management of sharable resources, strategies for optimum order.

MACKINNON, F., M. BRUNET, and A. C. MCEOWN, "The University as a Public Institution." *Can. Pub. Admin.*, III (Dec. '60), 337-53. Three articles: a history of the university in French Canada; an argument that the university is a community rather than a utility and cannot be measured by organizational efficiency; and a listing of the many service demands made on Canadian universities by local and provincial governments.

MACPHERSON, C. B., *et al.*, "Technical Change and Political Decision." *Intl. Soc. Sci. J.*, XII (#3, '60), 357-405. Four articles, including G. Langrod on "The rationalization of methods and means of action in public administration," R. Maddick on "Some effects of technical innovations on the relationship between central and local authority."

MAIR, L., "The Social Sciences in Africa South of the Sahara: The British Contribution." *Human Organization*, XIX (Fall '60), 98-107. Summarizes 15 years of research, as conducted through the East African Institute of Social Research, the West African Institute of Social and Economic Research, the Rhodes-Livingstone Institute, and several smaller sponsoring bodies.

MISRA, B. B. *The Central Administration of the East India Company, 1773-1834*, N.Y.: Barnes and Noble, 1960, $9.00. Finding that "the production of social wealth required different policies and devices than the production of private wealth," the Company developed a framework of administration, a body of civil servants, and governmental experience which rivalled those of most national governments of the time.

MACHLUP, F., "Are the Social Sciences Really Inferior?" *Southern Econ. J.*, XXVII (Jan. '61), 173-84. This should be the final word on invidious comparisons between social and physical sciences. They are compared on nine scores, *e.g.*, number of variables, the nature of verification, exactness, and predictability; social science differs from physical on several scores but has no inherent inferiority. "The social sciences are 'really inferior' regarding the place they are accorded by society and the priorities with which financial and human resources are allocated. This inferiority is curable."

MUSSON, A. E., and E. ROBINSON, "Science and Industry in the Late Eighteenth Century." *Econ. Hist. R.*, XIII (Dec. '60), 222-44. A case study of early Manchester industrialists suggests that a substantial minority of them, including the most significant, were strongly interested in the new scientific knowledge, for both utilitarian and intellectual reasons.

NICAISE, J., "Applied Anthropology in the Congo and Ruanda-Urundi." *Human Organization*, XIX (Fall '60), 112-17. The Belgian practice of training administrators of native policy in social anthropology was supplemented after 1945 by increasingly rigorous research, its institutionalization, interdisciplinary approaches, a shift from largely morphological studies to study of interrelations and change, and policy research.

ORCUTT, G. H., "Simulation of Economic Systems." *Amer. Econ. R.*, L (Dec. '60), 893-907. The nature and uses of simulations (training, design, system control, forecasting); models and their construction; computer methods for simulating complex large-scale systems. A simulation approach to models is more easily understood and mastered by nonmathematicians.

POLANSKY, N. A., ed. *Social Work Research*. Chicago: U. of Chicago Press, 1961, $5.00. Applications of research technology to problems actually encountered; both text and handbook. Covers problem formulation, study design, sampling, research techniques, analysis, "Measurement of Need," "Measuring the Effect of Social Work Intervention," etc.

RAHER, J., and A. M. FLORES, "Role of Emotion in the Precipitation and Exacerbation of Symptoms and in the Unexplained Death of an Adolescent with Dermatomyositis: A Case Report." *J. of Nervous and Mental Disease* CXXXI (Sept. '60), 260-66. One of many cases in which there is "an extremely suggestive correlation between the emotional impact of increasingly intense social pathology [here, family conflict] upon an adolescent and the appearance of somatic complaints culminating in her death."

RAO, K. S., "Economic Welfare of the Individual Cultivator and Co-operative Farming." *Econ. R.* (New Delhi), XII (Nov. 22, '60), 15-20. Indian farm management data show "that co-operative farming can increase aggregate production and leave the participants better off than before," though prior economic analysis of individual projects is necessary.

NAGEL, E. *The Structure of Science*. N.Y.: Harcourt, Brace and World, 1961, $7.50. Studies in the logic of scientific explanation, addressed to general serious audience. Treats relation of science to common sense, kinds of explanation, and problems in mechanics, biology, etc. Then inquires how social science works; examines the role of values in science and functionalism; analyzes collective entities; and ends with a detailed probe into recurrent problems of historiography. An authoritative treatment of a wide range of problems besetting social science, though not venturing into unknown territory. Even the natural science analysis is made relevant to the social scientist, seldom the case in most treatises on the logic of science.

RICKMAN, H. P., "The Reaction Against Positivism and Dilthey's Concept of Understanding." *Br. J. of Soc.*, XI (Dec. '60), 307-18. A German philosopher's theory of the human studies is supplementing the apparent inadequacy of positivism; life has meaning that finds understandable expression, "understanding" achieved not so much intuitively as through formal process.

RODWIN, L., "Metropolitan Policy for Developing Areas." *Daedalus*, XC (Winter '61), 132-46. How to devise a strategy of metropolitan development adapted to the cultural, economic, and political goals and institutions of a hypothetical underdeveloped country.

ROSENBERG, M. J., *et al. Attitude Organization and Change*. New Haven: Yale U. Press, 1960, $5.00. "A series of studies concerned with the consequences of various kinds of changes in the internal organization of attitudes."

ROSS, M., "Community Psychiatry as an Opportunity for Medical Leadership." *Archives of Gen. Psychiatry*, III (Nov. '60), 50-61. Outlines the "dispersal of responsibility for mental illness and health," asks psychiatrists to give primary support to "those programs in the community which reflect a concensus of psychiatry and medicine as to their soundness."

ROSSI, P. H., "Power and Community Structure." *Midwest J. of Pol. Sci.*, IV (Nov. '60), 390-401. A scheme for bringing classificatory order out of studies of local political structures, suggesting four types: pyramidal (highly centralized); caucus rule (the "cozy few"); polylith (separate power structures); and amorphous. With some specific hypotheses.

SCHLESINGER, A., JR., "On Heroic Leadership." *Encounter*, XV (Dec. '60), 3-11. The anamolous place of the heroic leader in classical democratic theory. We now need a reconstruction of democratic theory "to enable us to decide which styles of leadership democrats can use and which they must fight."

SHOBEN, E. J., JR., "Personal Responsibility, Determinism, and the Burden of Understanding." *Antioch R.*, XX (Winter '60-'61), 405-16. Social science has acquired high instrumental utility, but also "has substituted a kind of fatalism of events for the fatalism of divinity typical of older points of view. . . . Science is not an alternative to the evaluation of goals, norms, and the criteria of sanity and desirable solutions to the recurrent problems of living."

SIMON, H. A. *The New Science of Management Decision*. N.Y.: Harper, 1960, $2.50. Discusses decision-making research using computers to simulate human thinking, examines effects of new methods of business decision on organizational structure, work satisfaction, creativity.

SCHUBERT, G. *The Public Interest.* Glencoe: The Free Press, 1961, $5.00. A systematic examination of statements about public interest in the political science literature, relations between it and concepts of official behavior, its use and abuse by scholars, officials, and private-interest groups. Questions the utility and reliability of rationalist, realist, or idealist public-interest theory, concludes that there is no public-interest theory worthy of the name, that the concept is significant primarily as a datum of politics.

SMIDDY, H. F. *Management as a Profession.* N.Y.: Amer. Soc. of Mech. Engineers (paper 60-WA-61), 1960. An intricately constructed and detailed synopsis of the functions of managers, with an excellent chart of responsibilities. A kind of *summa* of the modern professional management school.

"Sociological Aspects of Leisure." *Intl. Soc. Sci. J.*, XII (#4, '60), 509-602. Articles on "Leisure and technological civilization," "Current problems of the sociology of leisure," "Popular culture: a humanistic and sociological concept," "Leisure, social participation and political activity," "The social planning of leisure," and reports of some current research.

SPENGLER, J. J., "The Population Problem: Yesterday, Today, Tomorrow." *Southern Econ. J.*, XXVII (Jan. '61), 194-208. Contrasts Malthusian-era views of the population problem with present and future views; it is probable that "50 years from now Malthusian sentiments if not Malthusian methods will again be commanding wide endorsement."

STEEL, R. W., "An Inventory of Land and People." *J. of African Admin.*, XII (Oct. '60), 211-23. Throughout the underdeveloped world there is a striking lack of data on production and population, yet such information is a first requirement for successful planning and development.

TAYLOR, G. R., ed., "The Tasks of Economic History." *J. of Econ. Hist.*, XX (Dec. '60), 515-658. Articles and commentaries, among them T. C. Cochran on "Cultural Factors in Economic Growth," C. Goodrich on "Economic History: One Field or Two?" L. E. Davis, *et al.*, "Aspects of Quantitative Research in Economic History," M. McLuhan, "Effects of the Improvements of Communication Media," and H. W. Broude, "The Significance of Regional Studies."

TINKER, H., "Authority and Community in Village India." *J. of African Admin.*, XII (Oct. '60), 193-210. Challenges presuppositions about village democracy in light of historical evidence; finds the present national development program at the village level directed largely from above by officials and political bosses; summarizes factors weakening community feeling.

ULMER, S. S., "The Analysis of Behavior Patterns on the United States Supreme Court." *J. of Pol.*, XXII (Nov. '60), 629-53. Some analytic methods applied to civil liberty decisions in the 1958 term suggest "cohesive blocs" of justices on such cases, led by Warren and Frankfurter. Social-psychological factors are *one* consideration in predicting judical behavior.

VOGET, F. W., "Man and Culture: An Essay in Changing Anthropological Interpretations." *Amer. Anthropologist*, LXII (Dec. '60), 943-65. An historical review of four anthropological conceptualizations of the man and culture reality. There has been a shift from static description of special forms to the processes that have given rise to these forms, their persistences, and changes. This trend must continue toward a unified social science; "a human reality that can be cut like a pie according to 'scientific' bias, can hardly further the understanding of man in nature, society, and culture for very long."

WAGNER, P. L. *The Human Use of the Earth.* Glencoe: The Free Press, 1960, $6.00. Attempts to bridge the "intellectual chasm that divides the social sciences from the physical and biological," examining the relation of man and his artificial environment to the natural and physical powers and elements with which he must deal.

WALDO, D., ed. *The Research Function of University Bureaus and Institutes for Government-Related Research.* Berkeley: U. of Calif. Bureau of Pub. Admin., 1960. From a conference on the present status of the "bureau movement"; papers summarize their research on public administration, politics, metropolitan affairs, their methods, problems, community interrelations.

WALLIN, J. E. W., "History of the Struggles Within the American Psychological Association to Attain Membership Requirements, Test Standardization, Certification of Psychological Practitioners, and Professionalization." *J. of Gen. Psych.*, LXIII (Oct. '60), 287-308.

WASSERSTROM, R. A. *The Judicial Decision.* Stanford: Stanford U. Press, 1961, $5.00. An approach to a theory of legal justification, evaluating three possible procedures of justification: precedent, equity, and a two-level procedure combining both. Also compares problems of justification in law with those of justification in ethics.

WOOTTON, B., "The Image of the Social Worker." *Br. J. of Soc.*, XI (Dec. '60), 373-85. Reviews three recent books presenting strongly contrasting images: E. F. Borgatta, *et al.*, *Social Workers' Perceptions of Clients* (N.Y.: Russell Sage Foundation, 1960, $2.00); L. Pincus, ed., *Marriage: Studies in Emotional Conflict and Growth* (London: Methuen, 1960, 25s); and B. N. Rodgers and J. Dixon, *Portrait of Social Work* (London: Oxford U. Press, 1960, 25s). The first two are noteworthy for the "priestly, if not godlike, role conferred upon caseworkers." The third gives a "concrete, objective description" of social services in an English town.

# The First National Law and Electronics Conference

*by* Irwin Chasalow

*The relations among legal practice and research, linguistics, logic, and electronic data retrieval were explored at last Fall's first National Conference on Law and Electronics, whose proceedings are summarized below. Included as general topics were "Electronics and the Administration of Justice," "The Language of the Machine and the Language of the Law," "Logic and Law," and "The Element of Predictability in Judicial Decision Making." Mr. Chasalow, a student at the UCLA School of Law, published a prior version of this article in the* California State Bar Journal, *Nov.-Dec. 1960.*

The first National Conference on Law and Electronics, designed to create a common interdisciplinary dialogue among representatives of the fields concerned with utilizing electronic data retrieval process for the administration of justice, was held at Lake Arrowhead, California, October 21-23, 1960. The Conference initiated a long-range program by UCLA's interdisciplinary Committee to Study Applications of Scientific Processes to the Administration of Justice. The conferees themselves represented industry, electronics, physics, philosophy, publishing, engineering, history, library science, linguistics, business administration, the judiciary, and the bar. The initial hypothesis for the Conference was stated by Chairman Edgar A. Jones, Jr., Professor of Law at UCLA: that the application of electronic processes to the law would result in a significant improvement in the administration of justice.

## Electronics and the Administration of Justice

Mr. Richard F. C. Hayden of Los Angeles began by analogizing the scientific abstract to the legal handnote. He compared scientific and legal research methodology to expose the failure, and resultant frustration, of earlier efforts using existing methods. He discussed the various tools of legal research in terms of their present uses, limitations, and needs, giving primary emphasis to the need for greater accuracy and predictability. He asked whether the new mechanisms were the proper instruments for filling the needs of the legal profession; whether they were economically feasible and, if so, to what extent; how much of the materials would have to be condensed by humans; and whether the goal of improved legal research on all problems would ultimately be accomplished.

Mr. Robert M. Hayes of Electrada Corp. said that the operation of foreseeable electronic mechanisms would be useful and economically feasible only where there is a large volume of activity, clearly defined processes, and a great amount of self-generated activity. The last point was intended as a note of caution for those who might regard machines as a panacea which would solve all the problems of the legal profession. In fact, the limitations of the input process would confine the abilities of the machine to aiding in the understanding, rather than in the solution, of the problems presented.

Finally, Mr. Felix Stumpf commented on the present economic condition of the Bar and the reasons for the low earnings of attorneys. Lawyers are "piece-workers" in a mass-production society, and consumers have been "supermarket-conditioned" by advertising and daily experience to expect that all goods and services will be rendered mechanically and at competitive prices. To offset this, "The profession must overhaul antiquated research methods wasteful of their time and energy." If this were not done, there would be further deprofessionalization of attorneys.

From the floor it was asked whether, in view of the low income of most attorneys, the practicing lawyer could afford the expense of EDR equipment for research. Prof. Jones suggested that network of regional computer centers, available to all attorneys, would eliminate the economic problem.

## The Language of the Machine, The Language of the Law

Dr. H. P. Edmundson of Planning Research Corp. discussed "The Scientist's Viewpoint" on machine language, suggesting that the differences in the linguistic structures of codes, statutes, and cases represent different types of language. There are a variety of separate languages relevant to the problem, including the machine's internal language and the languages of representation to the machine on both the input and output sides. Within these categories is a diversity of language levels—written, spoken, and quoted. All of these variables must be accounted for in evaluating the overall problem of transforming the language from its initial to its final, and functional, stage. "Semiotics" are divided into three major categories—syntax, semantics, and pragmatics—which are related in written expression to structure, meaning, and man, respectively. These represent a continuum of increasing difficulty for science. In illustration, four areas of automation research in order of their increasing difficulty are indexing, abstracting, translating, and deducing. Automation translating is presently on a less firm footing than indexing and abstracting, though it may have a future impact on international law. Automation deduction is so difficult as to be non-existent for all present purposes, and has led to divided opinion as to whether it should be implemented in law, or logic, or both.

Mr. John F. Horty, Director of the Health Law Center at the University of Pittsburgh, discussed the lawyer's viewpoint on machine language and legal research. As part of his project to research a statute dealing with tax exemptions for non-profit hospitals, a successful demonstration was given before the American Bar Association Convention at Washington, D.C., in Summer 1960. The demonstration required a search of all relevant statutes from all jurisdictions in the United States, which, with the use of the IBM 650, was accomplished in 6.5 minutes. The machine required another 25 minutes to print the entire text of the statutes selected.

Mr. Horty said that on the Health Law project he is currently receiving 30 per cent more material than is relevant to the problem at hand. This irrelevant material is not a major drawback, however, insofar as the machine provides the full text of the statutes rather than citations which would lead to further library work, perhaps without results. This type of utilization would be most useful for large law firms handling cases requiring a broad scope of research. The situation is one of economic difficulties rather than technical problems of great magnitude. In addition to researching statutes, such equipment could be utilized in administrative law and foreign law, and, eventually, for statutory drafting, historical research, and the determination of strategy by attorneys.

In the following panel discussion Dr. David Hays of RAND Corp. set forth the difficulties of standardizing sentence structure and grammar for machine translation, and suggested that the law put its language in neat, standard form. He asked how the meaning of the parts might be connected without having similarities verbalized in the text of the input material. To overcome these obstacles, lawyers need first to establish a sound theoretical, or philosophical, structure to provide consistency in their language.

Professor Addison Mueller of UCLA said that he was unable to accept Dr. Hays' proposal that the language of the law be altered to accomodate the needs of the machines. Aside from the feasibility of such an undertaking, he strongly believed that it *should not* be done. This was not a rejection of language alteration for the sake of improvement, but rather a denial of any rigid philosophical structure which would, by demanding conformity, constrict the growth and flexibility of the law. He concluded that science must meet the flexibility requirements of the law, for should the converse occur the law would stagnate as public policy became subordinated to notions of *Stare Decisis*.

## Logic and Law

Professor Layman Allen of the Yale Law School predicated that "modern" logic represents an invaluable tool which lawyers at the present time either are not aware of or have chosen to ignore. In addition to its possible

immediate use in drafting and interpreting written documents, logic has a potential value as a means of more precise communication among lawyers, thereby diminishing the number of disputes that arise from misunderstandings. Lawyers should look upon symbolic logic as an artificial language created to facilitate the precise communication of ideas; the prerequisite to this goal is the construction of specified criteria as to vocabulary and syntax. The resulting precision can be used by the attorney to increase either the clarity or ambiguity of his discourse in a "natural language" such as English. Conversely, the translation from English brings an awareness of syntactic ambiguities that can be controlled by techniques analogous to those used by logicians.

Professor Allen identified one relevant caveat limiting the use of logic in the law when he said, "When viewed as a language, it should be evident that there is nothing in logic any more than in any other language that offers criteria for how a given legal controversy *ought* to be resolved. Criteria that are other-than-logical are needed for resolving legal disputes." Among the specific uses for logic systems in the law are drafting, interpreting, and potentially, electronic data retrieval. In concluding, Professor Allen admonished the legal profession for its neglect of this "relevant intellectual tool," and suggested the possibility of establishing an "intelligence center" that would continuously appraise the impact of curent scientific and technological developments on the law.

In the panel discussion, Professor Alonzo Church of Princeton summarized the three ways in which it has been suggested that modern logic might contribute to law. The first is the use of propositional calculus and logic of quantifiers in clarifying complex documents or sentences intended for communication. The extremely elementary logic applicable in these situations probably would not be explicitly used so much as implicitly used. In considering the specific statutory problems presented by Mr. Allen, Professor Church said that he himself had used a case-by-case approach rather than an actual formulation in the symbols of propositional calculus. While training in elementary logic would improve this process, the types of problems requiring such analysis are not peculiar to the law. He added that he would of course make a general recommendation of such universally applicable training.

The second possible application was to devise a theory as to what the legal process consists of. Professor Church completely rejected this on the grounds that modern logic in its present stage lacks the necessary tools. The law is not a single process but a complex of infinitely variable processes, and human limitations preclude any apossibility that the body of the law will be either complete or consistent. Even if it were possible, the impracticality of such an undertaking would negate its value, and even the use of various kinds of model logic provide only a very remote possibility of application to the law.

In the third area of suggested applicability, the automatic retrieval of information, Professor Church admitted to complete confusion. Though he had frequently heard the conclusion that such application could be accomplished, he had not heard one specific example of how this might be done. Though recognizing a need for some application of logic to the "crude business" of searching all existing documents and confessing to a vague feeling that modern logic might somehow be helpful, he was compelled to conclude with a request to the group for a single specific example of how mathematical logic might advance the process, or organization, of automatic data retrieval. None was suggested.

### Predictability in Judicial Decision-Making

Justice Lee Loevinger of the Minnesota Supreme Court focussed on two aspects of this problem: first, the question of the degree to which judicial decisions are in fact predictable, either actually or theoretically; and, second, the question of what methods are available for attempting such prediction, particularly objective methods capable of explication, communication, and replication. By legal prediction is meant something sufficiently specific to be capable of empirical falsification or verification. This presently exists in the overview; that is, it can be accurately predicted that *X* per cent of burglars

brought to trial in a given jurisdiction will be found guilty. The prediction of judicial action in a particular case is of greater interest and potential utility, but here there are many complex contributing variables, such as the character and degree of the remedy sought.

Frequently it is assumed that there can be no measure of probability as regards a single case because of its uniqueness. In fact, no case capable of consideration or discussion is wholly unique or it would follow that we would have no way of either conceiving or discussing it. By developing actuarial tables, similar to those used by insurance companies, and by examining the specific case to determine its apparent position in the frequency distribution of the table, it should be possible to arrive at a conclusion that can be acted on with success. This would seem to furnish significant meaning for the term "probability."

Justice Loevinger went on to compare the clinical and statistical methods of predicting adjudication, among them statistical, quantitative, categorical, and comparative clinical analysis. He felt that these were not developed at present to a point of great utility, and consequently offered several alternative approaches to the problem of predicting judicial action. The first of these was a sample response survey, in which a sample of the record of a given case would be presented to a number of lawyers for individual determinations of the issues. This technique would seem to give a more general and consistent predictive value than any of the quantitative methods previously attempted, and a the same time would furnish an operational definition for a probability prediction as to the outcome of a single case.

A second method, also using a panel of attorneys, would be content analysis and comparison or analogy. A determination of the case in question would be reached "either by showing close analogy—or lack of it—to a precedent, or by comparison of the number of pivotal factors in the case at bar with those of particular precedents." The final method suggested was the original scale ranking of cases. Here the dominant element or pivotal factors would be given a value rank on a continuum, and the case at hand need only be fitted in the scale to arrive at a probability determination. This would be easier to establish than cardinal values, and due to its ease of use and general application would be a more powerful tool than any method thus far suggested.

In explaining the rationale of decision-making, Justice Loevinger summarily rejected the theories of yardstick determination and personal predilection of the judge at the time of decision. He did point out, however, the difficulties of rational explanation in determining the credibility of witness, in deciding a point which lies in the overlap of opposing legal principles, and in cases of public policy where the court is required to create new law. Nevertheless, in the vast majority of instances determination is reached by analysis of the elements that are relevant to given issues, the evaluation or assignment of weights to these elements, their application to specified facts, and reconciliation with the existing body of law.

In conclusion, Justice Loevinger sketched the outlines of future development and pointed out that the processes of legal analysis, prediction, and decision are inextricably interwoven with the processes of legal logic and data storage and retrieval. Modern scientific and logical techniques must be applied to the field of law; the ultimate task is nothing short of devising a system for describing all aspects of human behavior. This function shall never be discharged perfectly, or even adequately, but earnest and diligent application to the problem will result in significant progress toward a better world.

## Future Research

The consensus of the Conference, expressed in the final panel, was that the application of electronic processes to the law and the administration of justice is feasible. Nevertheless, the problems will require considerable research at the university level. Two conclusions appeared: that linguistic research will be a major necessity, and that the legal profession shall have to reexamine the fundamental jurisprudential assumptions of the law.

# Scientists vs. the Ideology of Science

Recent interviews with 57 researchers in six science departments of a major Midwestern university produced some amazing views of the "classic" ideology of science. S. Stewart West, now a research sociologist at the University of California Medical Center at Los Angeles, reported in the *I. R. E. Transactions of Engineering Management* that less than half the researchers believed in freedom of research in a classical sense; only one-third in impartiality; and only one-fifth in suspending judgment, in the absence of bias, in free diffusion of information, or in group loyalty. Only 27 felt that it was indispensable for the scientist to have unlimited choice of the problems he would investigate. Others felt that this freedom was desirable, but could be legitimately restricted to studies within a particular academic discipline, and that colleagues and superiors should be put in a position of judging the choice.

According to the classical concept of science, the producer of knowledge is viewed as completely neutral in his concern for how the knowledge is applied. Only one-third of those interviewed took such a position. About one-fourth felt that they could separate their roles as scientists and citizens, remaining impartial in the one but stating their position in the other. A smaller group said that information should be withheld if the consequences of disclosure were expected to be bad.

Another facet of the classical ideology is suspension of judgment until all the facts are in. Only 12 of those interviewed felt that there should be no exception to the principle, and 20 said it was definitely worthwhile to transmit useful hunches to one's colleagues. One biochemist declared, "Very important ideas sometimes have their merits without having proof." Fifteen said that the need to take action might take precedence over the need to obtain all the facts necessary to support a conclusion.

The classical ideology further says that scientists appraise facts as facts, impersonally and impartially. But only 12 of the 57 researchers said they evaluated findings solely on this basis. Often, other features of the environment were taken as indicators of the veracity of proferred fact. Thirty-two scientists mentioned personal characteristics as a basis for considering statements made by others, and nine said that both the person and the findings should be considered. Flying saucers came in for mention in seventeen interviews, and five respondents said flatly that they would not accept reports of such a phenomenon no matter who made the observation. (This seems to be a negative-authority position, for it is certainly not an inductive, empirical one.)

Only one-fifth of those studied supported the classical idea of permitting completely free access to scientific information. It was commonly observed that data with military value might reasonably be restricted.

A few more than half the researchers said that interests of fellow scientists demand a group loyalty that comes ahead of the rest of the public.

Researchers supporting the classical myth on the questions, it turned out, published no more frequently, nor were they observed by their colleagues to be any more strongly motivated in their work than those who held contra-classical opinions. In fact, the slight difference that existed was in the opposite direction: the less productive, weakly motivated researchers held the classic ideology a little more frequently and strongly. There was no evidence of any difference in ideology between the pre-war and post-war generations, nor between age groups, on any of the major questions asked.

Dr. West remarks, "Apparently, if there ever was a reasonably firm consensus with respect to the classical scientific values, it was not maintained long after 1920. It may never have been more than a myth."

## IN THE NEWS

*continued from p. 2*

onstrated by these new projects: a study of the "political modernization" of Japan with special reference to the Allied occupation and its aftermath, by J. W. Hall and R. J. Spaulding, Jr. (hist.) R. K. Beardsley (anthro.) and R. E. Ward (pol. sci.), on a $200M grant from Carnegie Corp.; a study of individual orientation to large organizations with $38M from the U.S. PHS, by D. Pelz of *Survey Research Center,* who also directs a new $5M study of scientific personnel sponsored by IBM Corp. • *NORC* (U. of Chicago) will survey 50,000 college seniors this Spring to determine why college students go on to graduate training, under a $126M grant frm the Natl. Institutes of Health, the NSF, and the Office of Ed. jointly. Peter H. Rossi directs the study. • A *Conference to Plan a Strategy for Peace* was held at Harriman, N.Y., Jan. 12-15; a report will go to government officials for study. • Applications for 10-15 *Citizenship Clearing House* Grad. Fellowships in State and Local Govt. for 1961 must be in by March 31st; they provide $400/mth. to students in pol. sci., pub. admin., econ., soc., related social sciences for four-five mths. service with party officials or public administrators. • The U. of Calif. Extension at Berkeley has established a *Leadership Training Center* to serve community leaders in northern California; it will interpret and disseminate social science research, point up its applications to community problems. • A three-day forum on "A Preview of Some Legal Problems Ahead in the Use of Electronic Data Processing in Business, Industry and Law" will be held in Washington, D.C., March 23-25, sponsored by the *Amer. Law Inst.* and the *Amer. Bar Assoc.*

PERSONALIA • Late in Jan. ten professors received prizes of $10M each "for distinguished accomplishment in humanistic scholarship" from the *Amer. Council of Learned Societies.* They were: William F. Albright (oriental studies, Johns Hopkins); H.-R. Hitchcock (hist. of architecture, Smith College); Werner W. Jaeger (classics, Harvard); Frank Knight (economics, U. of Chicago); R. Krautheimer (hist. of art, NYU); C. I. Lewis (phil., Harvard and Stanford); P. G. E. Miller (Amer. lit., Harvard); Otto Neugebauer (hist. of sci., Brown); O. Strunk (musicology, Princeton); and Quincy Wright (intl. law, U. of Chicago).

FOUNDATIONS • Ford F. gave $5.4 million to U. of Chicago for 10-year support of its South and SE Asian, Russian, and Far Eastern programs, and for 5-year support to comparative education and law, African and Near Eastern research, language teaching. • Ford also gave $5.67 million to the *Amer. Council of Learned Societies* for research and publications in humanities and social science; $150M for 5-year support of the *Natl. Assoc. of Foreign Student Advisers;* and $120M to *European Inst. of Bus. Admin.* (Paris) to develop faculty and teaching programs, provide fellowships for foreign students. • Lilly Endowment has given another $115M to the Union College *Character Research Project.* • Carnegie Corp. gave $350M to support Columbia U. Law School's *Project on Intl. Procedure,* which is studying problems of litigation between the U.S. and other countries. • C. E. Merrill Trust gave $71M to Atlanta U. to train 15 teachers in humanities and social sciences. • Further Ford grants: for non-Western and intl. teaching and research $1.3 million to Northwestern, $1 million to U. of Penna., $265M to Notre Dame; $375M to Syracuse to provide internships in pub. admin. and law in Africa and S. Asia; $165M to *Assoo. for Asian Studies* to further Asian studies in the American educational system in general; $110M to NYU for research on problems concerning uses of intl. rivers; $100M to *African Studies Assoc.* for its special committees on linguistics, research, libraries.

ON THE COVER: This is neither proof of 4,000 years of retrogression in the art of symbolic design nor a *tableau vivant* from the Chicago World's Fair of 1893. As any graduate of the United States Naval Academy at Annapolis will fondly tell you, it is a fragment from the bottom of his bizarrely engraved diploma, provided for us by Clark Cameron, whose article appears on pp. 3-7.